



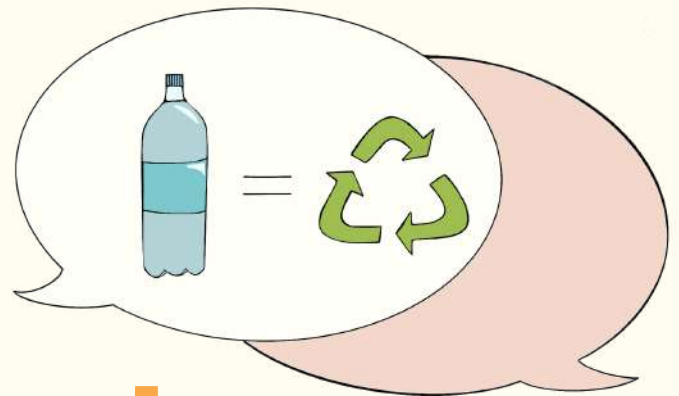
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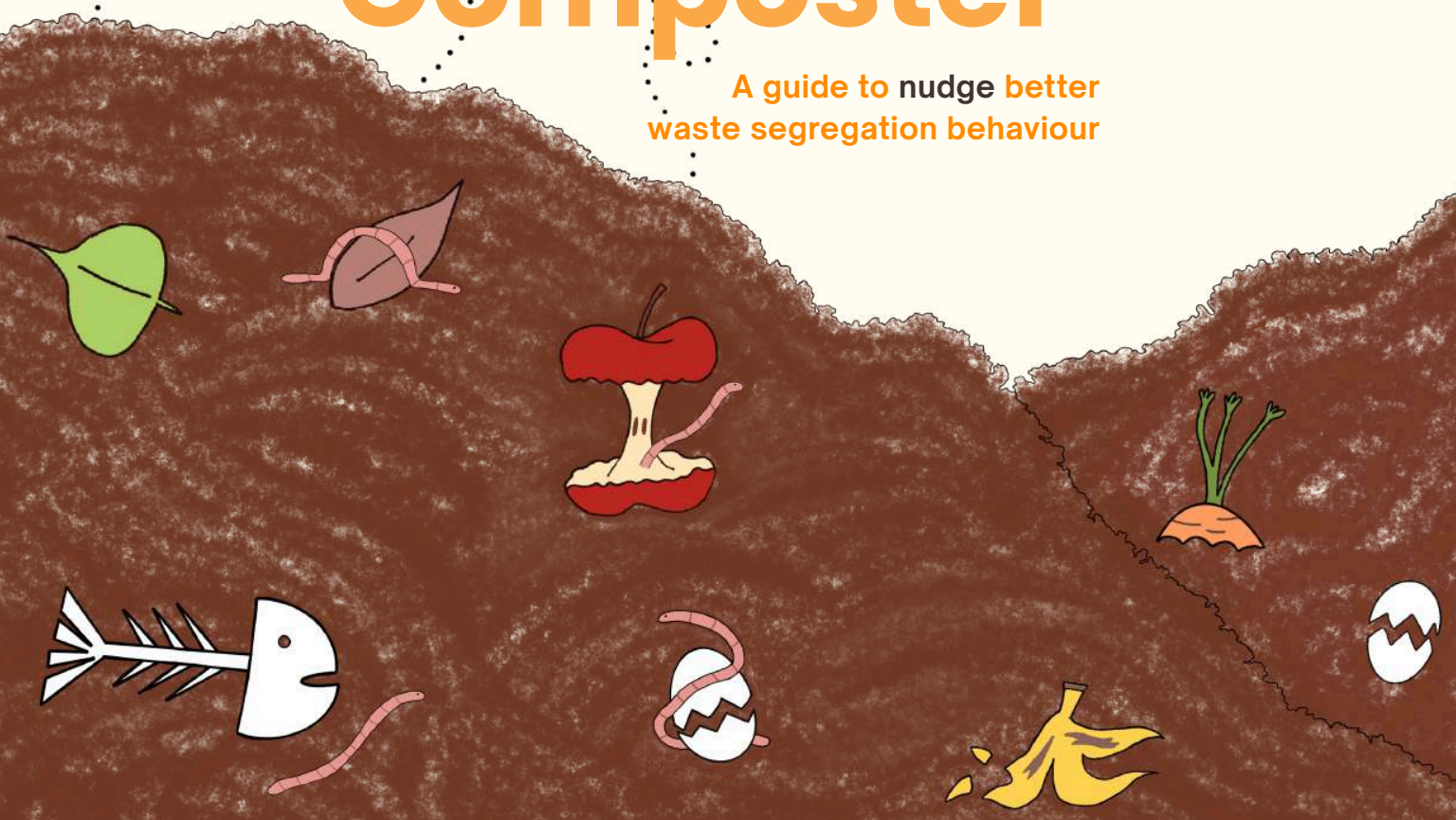
URBAN
OCEAN



Hook, Line & Composter



A guide to nudge better
waste segregation behaviour



ROKA

(Residents of Kasturba Nagar Association, Adyar)

WE ARE





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Hook, Line & Composter

A guide to nudge better waste segregation behaviour.



Okapi Research & Advisory, Chennai Resilience Centre and the Residents of Kasturbanagar Association (ROKA) have been working together since 2023 on the 'We Segregate' project to transform Kasturba Nagar in Chennai into a near zero-waste neighbourhood.

The two broad objectives of the project are :

- To provide opportunities to residents to encourage waste segregation at the apartment level through physical interventions such as lane composters and punch the plastic hooks;
- To engage in a sustained awareness campaign through door to door interactions as a means to encourage source segregation and long-term behaviour change.

This project is being implemented with the support and financing of the Urban Ocean program. Urban Ocean is a capacity-building and accelerator program to end ocean plastic pollution and build more resilient communities in cities. This program is present in 12 cities across Latin America and Asia, including 4 Indian cities, and is jointly implemented and funded by The Resilient Cities Network, The Circulate Initiative, and Ocean Conservancy.



Read more about the Urban Ocean program
at resilientcitiesnetwork.org/urban-ocean/

Acknowledgements

Our gratitude to the Resilient Cities Network, The Circulate Initiative, Ocean Conservancy and the Urban Ocean program for providing a global platform through which we have gained immense support and encouragement for the We Segregate project.

We thank our collaborators - Chennai Resilience Centre, Greater Chennai Corporation, Urbaser Sumeet, Bisleri International and Spreco Recycling for their continued support and cooperation for the project's day to day operations.

Last, but most certainly not the least, we would like to extend our heartfelt gratitude to the Residents of Kasturbanagar Association (ROKA) and the resident volunteers from Kasturba Nagar without whom, sustaining such an impactful project would not have been possible.



Preface

Hook, Line & Composter

A guide to nudge better waste segregation behaviour.

Source segregation rates are low in most Indian cities including Chennai - estimated at 80%¹ officially but likely to be only 20 to 25%.² Official estimates state that the waste generated per day in the city is ~6000 metric tonnes,³ major chunks of which are dry waste (38%) and biodegradable waste (45%) which could be recovered for recycling / composting if segregated appropriately.

While 400 tonnes of the dry waste material does get recovered every day through informal routes (waste pickers removing waste and selling it to scrap dealers), majority of it is not, due to heavy contamination. This limits recycling options. High contamination also creates unsafe working conditions for conservancy (sanitation) workers and waste pickers.

Further, dry waste such as MLP (multi-layered plastics), commonly used in packaging food and single use plastic bags are widely littered items which clog waterways, storm water drains and end up in dumpsites. This is because of their low monetary value which discourages formal / informal workers from collecting them despite their recycling potential.

1 Ministry of Urban and Housing Affairs. (2023). Swachh Survekshan Rankings, <https://ss2023.sbmurban.org/#/ranking/factsheet/803339>.

2 Circularity Informatics Lab. (2022). Circularity Assessment - Chennai, India. University of Georgia, Athens, GA, USA, https://www.thecirculateinitiative.org/wp-content/uploads/Circularity-Assessment-Protocol_Chennai.pdf.

3 Greater Chennai Corporation. (n.d.). Solid Waste Management Department, <https://chennaicorporation.gov.in/gcc/departments/solid-waste-management/#Solid>.

The ‘We Segregate’ project sought to address these issues by introducing the following nudges to influence waste segregation behaviour of residents to transform Kasturba Nagar into a near zero waste neighbourhood.

- Lane composters (3 units) to divert and process biodegradable waste;
- Punch - the - Plastic (PtP) hooks (40 hooks) to collect low value soft plastic waste such as MLPs and single use plastic bags that often end up in dumpsites due to high contamination and low monetary value;
- Sustained awareness campaign through Door to Door (DtoD) interactions, online and offline mediums to encourage source segregation and long term behaviour change.

As noted above, this does not address **ALL** categories of waste and the present focus is narrowed down to the two critical categories. The team aims to expand the effort to other categories systematically one step at a time. Thus, this guide is also focused on these two critical waste streams.

Why Kasturba Nagar?

Since 2019, Residents of Kasturbanagar Association (ROKA) has been actively working to improve segregation rates in Kasturba Nagar by encouraging sustainable behaviour and conducting local recycling initiatives like waste collection drives. Consequently, when Chennai joined the Urban Ocean program, the implementation team decided to collaborate with ROKA as their SWM work was a natural fit for the Urban Ocean program’s goals. The team further believed that through effectively leveraging ROKA's connections with local municipal authorities and Kasturba Nagar residents, advancements in SWM could be achieved on the ground.

What Is This Guide For?

The purpose of this guidebook is to provide a detailed account of the steps taken to achieve the above goals and to present a workable and practical model that can be successfully replicated in other neighbourhoods by RWAs or public-private-civic collaboratives in Chennai and other cities in India motivated to achieve similar goals of sustainable waste management!

Project Impact

Oct 2023 – Sept 2025

The project kick-started on **11th Oct 2023** with a public event that was attended by government officials, members of the press, local residents and Urbaser Sumeet officials, among others.

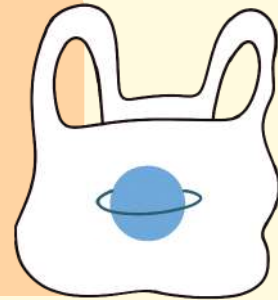


1005

households reached through the door to door campaign

584

kgs of soft plastic diverted from households, including MLP



kgs of compost generated from organic waste

3186

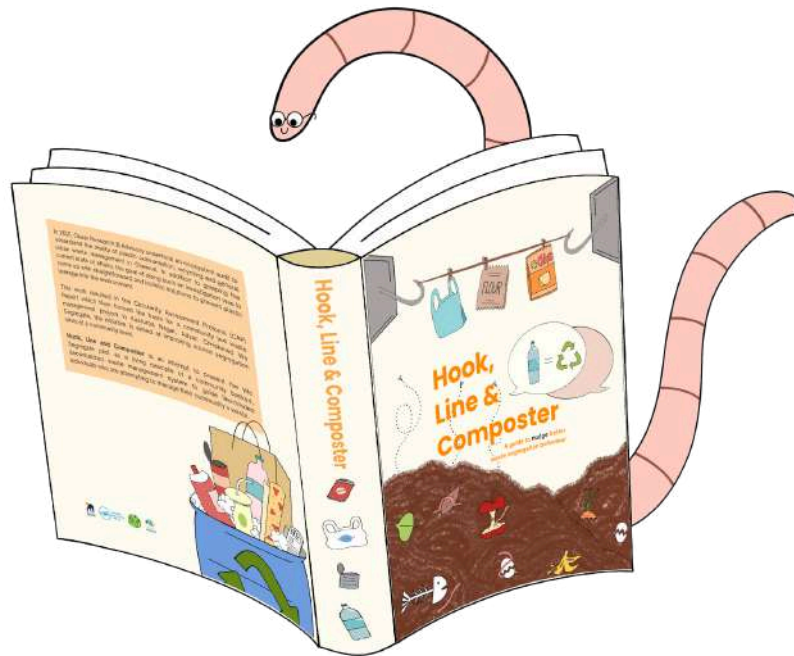
kgs of organic waste diverted, including kitchen & plate waste

9200



The We Segregate team studied change in resident's waste segregation behaviour over six to seven months and observed the following : buildings '**not segregating**' dropped from **48% to 31%** and those '**segregating well**' increased from **37% to 54%** between **October 2023 to March 2024**.



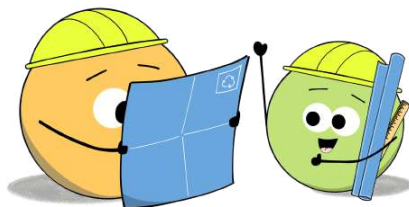


Project Disclaimer

While the project has experienced success, it is not a perfect model with **ALL** the answers.

The team has and continues to face challenges in sustaining the project. This guide is a reflection of the team's experiences in community waste management. We hope that these learnings and suggestions empower others on their waste segregation journey.

We Segregate Checklist



The following is a ‘checklist’ corresponding to the three components of **We Segregate**. While this list provides a quick overview of activities that will help make your community near zero-waste, it is not meant to be exhaustive or prescriptive and tasks can be modified according to your community’s context.

Punch The Plastic Hook

Activity	Potential Partners	Status
Pre-planning		
Estimate need or number of hooks required and gauge interest among residents to put them up	<ul style="list-style-type: none"> Residents / RWAs Waste Aggregator Waste Recycler 	
Identify waste aggregator & recycler who will collect & process the waste		
Permissions & Buy-in		
Get permissions from building secretaries / resident associations / relevant government departments in case of public institutions or others as required	<ul style="list-style-type: none"> RWAs Building Secretaries Urban Local Bodies (like GCC) Public Waste Contractor (like Urbaser Sumeet) Community Volunteers 	
Create awareness among residents on how to punch plastics to ensure these are clean & dry		
Implementation		
Fabricate hooks	<ul style="list-style-type: none"> Local Fabricators / Welders Carpenter / Handyman 	
Install hooks and put up signage for easy & clear disposal		



Lane Composter

Activity	Potential Partners	Status
Pre-planning		
Estimate need or number of composters required and gauge interest among residents to put them up	<ul style="list-style-type: none"> Residents / RWAs Public Waste Contractor (like Urbaser Sumeet) Different Composting Unit Vendors Other Users 	
Get feed back / compare across composter models to identify the most suitable model		
Identify site(s) that will be suitable for the installation and operation of the lane composter(s)		
Develop an operational plan to collect and transport segregated organic waste		
Permissions & Buy-in		
Get permissions from building secretaries / resident associations / relevant government departments or others as required	<ul style="list-style-type: none"> RWAs Building Secretaries Urban Local Bodies (like GCC) Public Waste Contractor (like Urbaser Sumeet) Community Volunteers 	
Create awareness among residents on how to segregate organic / wet waste and to make sure there are no contaminants (like plastic)		
Implementation		
Order the composter(s)	<ul style="list-style-type: none"> Composting Unit Vendor Carpenter / Handyman 	
Install the composter(s) and put up signage for easy & clear disposal		
Order cocopeat & tools required to compost		



Awareness Campaign

Activity	Potential Partners	Status
Pre-planning		
Identify the target audience (e.g. age, socioeconomic status, education level etc.)	<ul style="list-style-type: none"> Residents / RWAs Community Volunteers Interns from colleges / schools 	
Develop the content of the campaign - how will the target audience get convinced and what can they do to change their waste disposal behaviour		
Design a tentative schedule for awareness activities (distributing brochures, door to door visits, in-person events, live demos, Whatsapp messages etc. as applicable)		
Permissions & Buy-in		
Get permissions from building secretaries / resident associations or others as required to meet with residents	<ul style="list-style-type: none"> RWAs Building Secretaries Community Volunteers 	
Implementation		
Design communication material - hard and soft copies	<ul style="list-style-type: none"> Community Volunteers Paid Personnel 	
Conduct awareness activities as per decided schedule		
Operations & Maintenance		
Record resident feedback through surveys (online / offline) or other tools and design new awareness material accordingly	<ul style="list-style-type: none"> Community Volunteers Paid Personnel Interns from colleges / schools Sanitation Workers 	
Monitor impact by assessing the number of households that have converted and are following good segregation practices		



Notes



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Glossary Of Acronyms

BoV	Battery-operated Vehicle
BBFC	Bisleri Bottles for Change
DtoD	Door to Door
GCC	Greater Chennai Corporation
KNRA	Kasturba Nagar Residents Association
LDPE	Low density polyethylene
MLP	Multi-layer plastic
PtP	Punch the Plastic
PVC	Polyvinyl Chloride
ROKA	Residents of Kasturbanagar Association
SWM	Solid Waste Management

Contents

Acknowledgements	7
Preface	8
Project Impact	10
We Segregate Checklist	12 - 16
Glossary Of Acronyms	18
Chapter 1 : Punch The Plastic Hook	20
Chapter 2 : In-Situ Lane Composters	34
Chapter 3 : Dropping A Line To Residents	63
Note From Residents Of Kasturbanagar Association (ROKA)	91
Glossary Of Terms	93
Additional Information	98
Meet The We Segregate Team	101



1. Punch The Plastic **Hook**



What Is A Punch The Plastic (PtP) Hook?

The PtP hook is a simple and space efficient method of collecting soft plastics in one's house, apartment complex, office or school. The hook, designed by IIT - Madras, was first tried on a larger scale in Kasturba Nagar. The design is quite simple and can be created by any local fabricator / welder.

The PtP hook (**fig. 1**) is a metal implement designed to be attached to a flat vertical surface. Collected soft plastics (e.g. grain packets, shopping bags, etc.) are to be 'punched' into the hook by piercing them into the sharp end of the hook and pushing them down thus ensuring space for more waste to be collected.

For the hook to work effectively, users need to clean and rinse soiled packets before punching them in so that the waste collected is of good quality for recycling. As such, the vertical positioning of waste on the hook allows for any remaining liquid to drain out (if the packets are punched in such a way that the opening is facing the ground) and for the material to be aired out, avoiding malodour and pests. **This setup results in waste being collected in a clean, dry manner allowing for efficient processing.**



Figure 1 : Soft plastic being 'punched' into the hook by a resident

Pre-Planning And Setup



Convincing residents and fabricating the hooks :

Before embarking on creating the hook, one needs to have a good understanding of how many hooks are required and therefore how many households / apartments are willing to have them installed in their premises. It is worth to note that residents might need quite a bit of convincing.

As such, one might find it useful to have conversations with apartment association secretaries and residents using different tools such as face-to-face interactions, posters / flyers and social media. Requests may arise for a trial, where residents may want to see / use a prototype of the hook before committing to a permanent installation. In these cases, a sample hook could be made by a local fabricator and installed in a volunteer's house, before ordering in bulk.



For the We Segregate project, interested residents were given an opportunity to volunteer to be the first batch to have the hooks installed in their buildings. Once the team identified this first set of buildings, the next step was to approach the respective apartments' association members to communicate the project details, project goals and finalise the location of the hooks' installation.

The team also had to get permission from IIT - Madras to replicate the hooks since it was used for the first time on such a large scale outside the campus. **IIT - Madras is open to readers of this guide replicating the hook's design for use in their own homes / apartments / neighbourhoods.**

The project team consciously chose a **local fabricator** as it would be easy to source hooks in the event that more were required. Further, the fabricator's services were required for other aspects of the project like installing the lane composters (detailed in chapter 2) and so, this was a good opportunity to reduce transport costs and the associated GHG emissions.

Identifying organizations to collect and process soft plastics : While the number of hooks required is being determined and the fabricator is being chosen, one should simultaneously start to identify partner organizations who can collect and process the punched waste. **This task can take a while which is why it is important to start doing it at the very beginning so that the entire waste management cycle, from generation to collection, transport and finally processing, is clear.**



At Kasturba Nagar, the team started to identify partner organizations early in the planning process to :

- Transport collected soft plastics to a recycling firm, record the waste's weight and report the data to the project team;
- Recycle / reuse the soft plastics, as the team's aim was to avoid following the commonly used processing method of incineration. **Instead the team wanted the soft plastic processing to involve reuse of the actual material without it being burnt in a furnace.**

As per the above criteria, two organizations were selected for collection, transport and processing of soft plastic (**fig. 2**) :

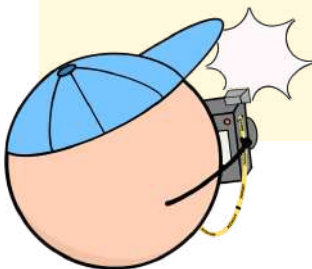
- **Bisleri Bottles for Change (BBFC)** : Logistics partner to collect the soft plastic at regular intervals and record weight information;

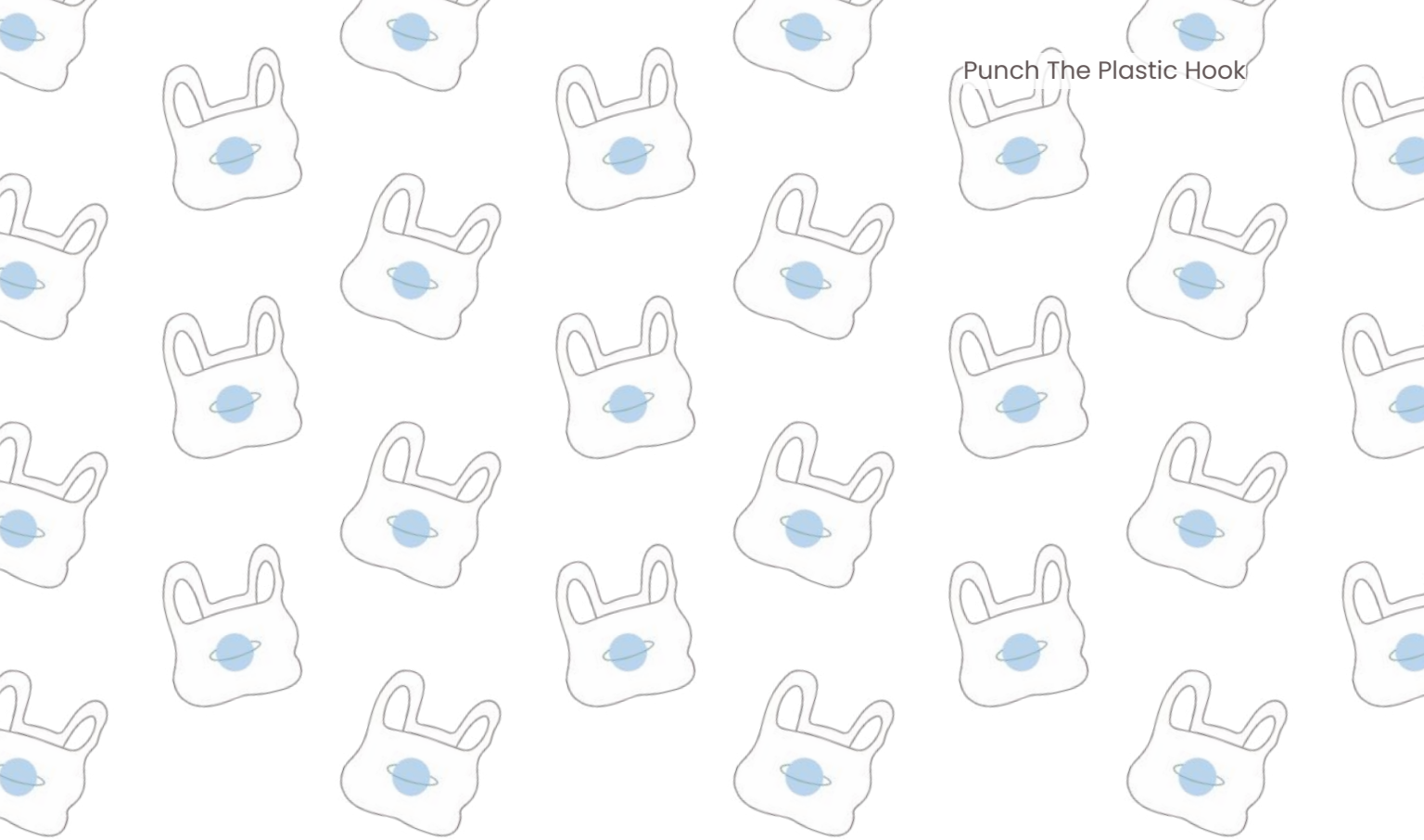
- **Spreco Recycling Pvt. Ltd. (Spreco)** : Aggregator / Recycler who further segregates the soft and hard plastics, checks the material for contaminants and reuses it to make different products such as boards, paver blocks, bricks, and other construction alternatives.

While, in Kasturba Nagar the above mentioned process was followed, it is possible, in some scenarios, that logistics and recycling is undertaken by a single organization. In fact, this is the case for certain kinds of waste like Tetra Pak cartons. However, for single use plastics, the waste usually flows through a channel and exchanges hands from aggregator to aggregator until enough quantity of waste has been collected. After this, it finally reaches a recycler who has the required specialized industrial machinery to process the waste in large quantities.



Figure 2 : Soft plastic being collected by BBFC personnel (**left**) ; Plastics being sorted at Spreco's facility (**right**)





Waste Collection

Educating residents on how to use the hooks : When the hooks are being installed, residents can be educated on what waste to punch and how to punch their waste (**fig. 3**). This messaging can be provided through different tools like live demonstrations, short videos, WhatsApp messages, emails and flyers. In such messages, it is important to cover the following points :

- **What types of plastics can be punched :** these include any kind of soft plastics such as milk packets, grocery packets, grain packets, plastic shopping bags, chips packets, chocolate wrappers and bubble wrap;
- **How to cut the soft plastic packets :** cutting horizontally instead of diagonally so that the corner opening is not completely detached from the packet and also gets collected for recycling;
- **How to punch the plastics :** by rinsing soiled packets and then hanging them such that the liquids drip down (such that the opening is facing downward).



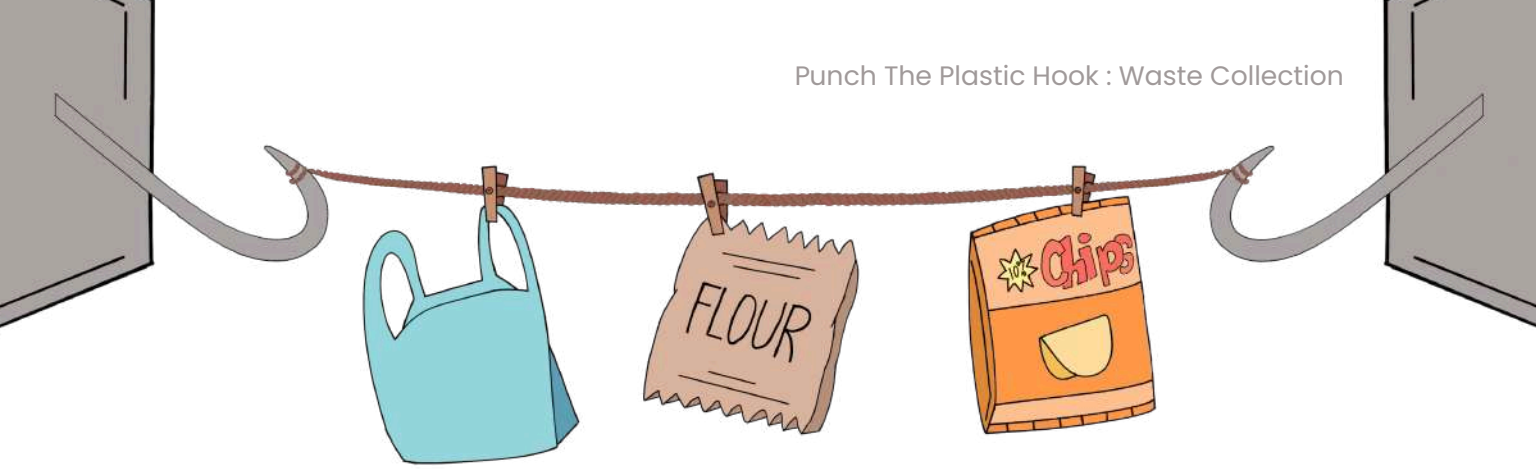
For the We Segregate project, the team designed a poster which illustrated what kinds of plastics can be punched into the hook. This poster was either stuck near the hook or hung on the hook itself using rope and was placed in a way to catch the attention of someone coming to punch their waste.



Figure 3 : The poster laminated and affixed next to a PtP hook (top) ; Poster depicting the different types of soft plastics that can be punched into the hook (right)



Video illustrating usage of PtP hooks



Planning and scheduling waste collection : The plan for collecting 'punched waste' needs to be finalized with residents, apartment secretaries and the waste collector (who would have already been identified at this point). Some factors to consider while planning are :

- If there is only one hook in an apartment block it might get filled up quicker than the number of times a waste collector can come for pickup. In this case, how will residents collect the additional plastic waste that they generate?
- Before a scheduled pickup, will there be a need to consolidate the punched plastic from all the hooks? This need may arise if the waste collector is unable or unwilling to collect plastic from individual hooks.
- If each household in an apartment has a hook, then how will each of their waste be collected? And by whom? All the individual household waste should ideally be at a central point so that the waste collector can pick it up from each apartment building instead of from each household.
- At what frequency would the waste need to be collected?
- If there is a mix of apartments, with and without PtP hooks, on the same street then how would the waste collector (who is new to the area) identify the apartments to collect from? A sticker at the gate could help here.
- Would the waste collectors need to be paid? If so, how much? Ideally, the waste collector should be paying for the waste since they are getting a good quality resource. However, as the market value for soft plastics is extremely low and quantity determines price, one should not expect to gain anything monetarily in this process.



At Kasturba Nagar, the We Segregate team initially worked with BBFC for the soft plastic collection. PtP hooks were installed in 40 apartments on 3 streets and waste was collected from all the hooks once every two weeks. This frequency was later reduced to once a month. To assist the collection vehicle in identifying the residential building with an installed PtP hook, a simple sticker (fig. 4) was designed and placed near the front entrance of each of the apartment buildings. The team made sure that the stickers were visible to the personnel who come to collect the waste.

Since 2025, this collection system has changed, with the team now being assisted by Urbaser Sumeet's Battery - Operated Vehicle (BoV) drivers. These BoV drivers, who are also referred to as conservancy workers, consolidate the punched plastic from individual hooks and deposit it at a designated place in each street. The BBFC team then picks up the waste from these spots during their scheduled pick up.

After pick up, the collected waste is dropped off at Spreco's processing centre. Here, the soft plastics are checked for contaminants before being shredded, combined with Low Density Polyethylene (LDPE) and processed into boards (that are then used to make furniture). This procedure was verified by the team during site visits and meetings with Spreco.



Figure 4 : Sticker designed for units with hooks. The sticker was placed near the front gate to make identification easy

Recording waste quantity : One of the critical factors that would make a project like this sustain in the long term is recording the quantity of waste collected through each hook. **Having this data can help to convince more residents and more apartments to join the movement to manage their own waste!** The process of recording data is quite simple - whoever collects the waste, weighs it right after removing it from the hook and enters the data in a log book which is kept handy.



For the We Segregate team, recording the waste collected was critical to estimate impact, convince potential funders and report back to residents. **Currently, BBFC collects and records the weight of the consolidated soft plastic kept at designated spots on each street (fig. 5).**



Figure 5 : (Clockwise from top left) PtP hook waste being consolidated by paid labour personnel ; PtP hook waste being consolidated by Urbaser Sumeet BoV operator ; Soft plastic being weighed by BBFC at the time of pickup

Challenges

Logistics cost and pickup schedule : Collecting the soft plastic from multiple apartments could be logistically cumbersome for a waste collector. In fact most waste collectors would prefer to pick up the waste from a central location. Therefore, the operational plan for collecting the punched plastics should also include details on how the plastics will be collected from each building / hook, transported and stored at the designated point for pick up.



In the case of We Segregate, the project team decided to consolidate the punched plastic to one location in each street (near the lane composters that are detailed in chapter 2). For a few months, this was done by a paid labour personnel right before a scheduled pickup. **Since 2025, Urbaser Sumeet personnel have also been assisting the team in this soft plastic consolidation.**

Residents' concerns : Residents may be apprehensive about the hooks due to concerns about the additional effort required to separate out the plastic, possibility of pests, effects on *vastu* and spoilage of the building's aesthetics (the hooks require holes to be drilled into the wall for installation). These issues need to be resolved on a case by case basis through direct discussion.



In Kasturba Nagar, residents raised the following concerns about the hooks and were provided with appropriate explanations :

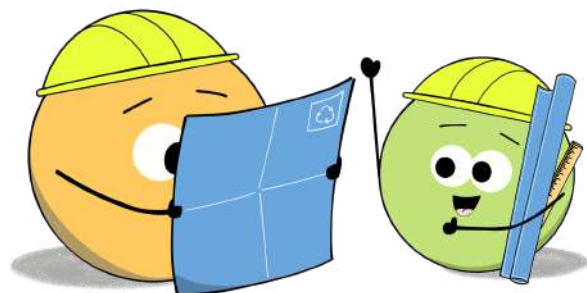
- **“Extra effort is required to clean and separate soft plastics from already segregated dry waste.”** : This concern was addressed by highlighting the ecological impact that low value plastics have, especially

when they are littered or ‘leaked’ into the environment. For more details on the DtoD awareness conducted in Kasturba Nagar, please refer to Chapter 3 - Dropping A Line To Residents;

- **“The hooks attract pests.”** : The field team reiterated that this concern is a non-issue as the hooks are designed to allow the punched plastic to dry and drain any remaining liquid / food particles;
- **“The hooks are unsafe.”** : Residents were assured that although the PtP hook is sharp, it would be installed at a height that would not be accessible to the very young children. Moreover, the hook was designed in such a way that the sharp end was bent inward and was not at an angle to cause accidental injury or impaling. To stave off any remaining anxiety, a video was created and shared by local volunteers showcasing children using the hook to punch waste plastic. In addition to being a demo, this video also served as proof of the hooks’ safety;
- **“The hooks ruin our building aesthetics.”** : After meeting with association members, the hooks were placed in mutually agreed upon spots.

Number of hooks : Multiple hooks may be required for buildings with several households as the quantity of waste generated would be higher. Once the hooks become full in these apartments, residents may need to move the collected plastic to a temporary arrangement like a sack / box to continue collection till the specified pick up date.

Consolidating the punched waste : All the punched waste can be transferred into a large sack and then taken to the designated pick up point. The waste collector can then weigh the waste, empty the contents into their vehicle and return the sack to be filled up again.



Frequently Asked Questions

What material is the hook made out of?

The hooks are made out of solid iron. Before replicating in other neighbourhoods, care must be taken to ensure that the chosen material is rust-proof and can withstand prevalent climatic conditions.



How much did it cost to fabricate the hooks?

Per hook, fabrication cost INR 150/- and installation cost INR 50/- .



15 months into the project, the team found that some of the hooks were not sturdy enough to withstand the local climate and needed replacing. This could have been avoided if the hooks were made with a more robust material (with more density). This, however, might cost more than INR 200/- depending on locally available resources and market rates.

Where were the hooks fabricated?

These hooks were fabricated by a local welder.

How were the hooks installed?

The hooks were installed by drilling holes into the wall corresponding to the holes in the base plate and securing the hook with screws.

How much waste can the hooks hold?

From the end to end, i.e. from the pointy tip of the hook up to where the hook's flat end is joined to the base plate, each hook measures 12 cm in length and can hold about 2 to 3 kgs of soft plastic at a time. In instances where the hook gets filled quicker than the scheduled pickups, residents can collect the plastic waste temporarily in a box or bag and continue to use the emptied PtP hook until the next scheduled pickup.



Observations through the We Segregate project revealed that residents who were already segregating their waste to a certain extent utilize the hooks as intended and with great success.

The collection in these buildings is so high, that residents are using a separate bag (fig. 6) to collect the soft plastic as the hook get filled quickly. This bag is sometimes hung on the hook itself and residents make sure to only fill it with clean and dry soft plastic so there are no odour or pest issues.



Figure 6 : Hooks where residents have used big plastic bags to hold smaller bags

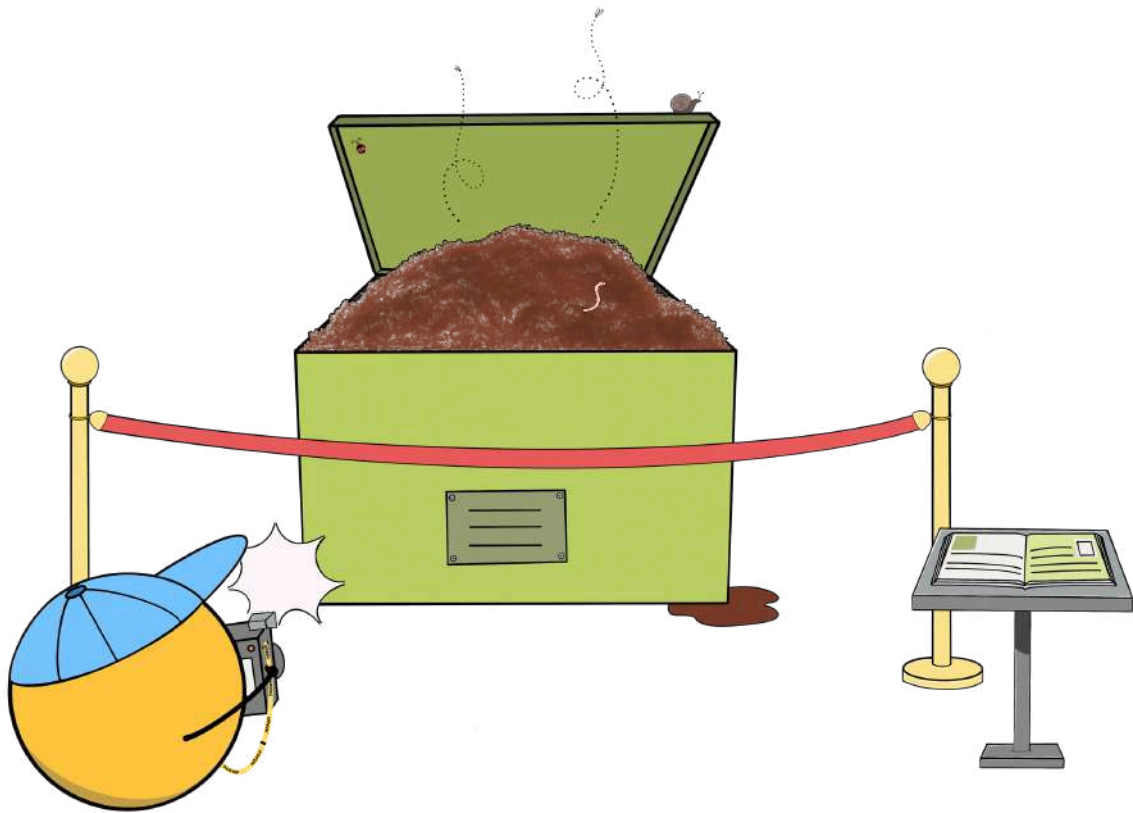
How often would pick ups need to be scheduled?

This depends on the quantity collected and availability of transportation. For this project, pickups are currently scheduled once a month.

Will a local kabadiwalla take the collected soft plastic waste?

A local kabadiwalla could take the collected soft plastic depending on whether they are able to monetize it in their scrap-for-sale ecosystem. This will need to be determined by speaking with local scrap shop dealers. However, they typically do not take soft plastic waste since they would need to collect it in huge quantities for it to be economically viable, i.e., for them to be able to find interested buyers and sell the collected material for a reasonable value.

2. In-Situ Lane **Composters**



What Is A Lane Composter?

Lane composters, as the name suggests, are units which compost biodegradable waste at a street level. While there is no definition or technical specifications for a lane composter, typically they are units designed to enable layering, churning and aeration of biodegradable waste, and easy removal of compost tea and the compost. Therefore, think of lane composters as **community composters!**



For the We Segregate project at Kasturba Nagar, the team installed three composters comprising two types of models, called ‘**Eartha**’ and ‘**Eira**’ (fig. 7), manufactured and sold by **Endlessly Green**. These units are made of a fibre-reinforced polymer and are designed to compost about **1200 litres (or 600 - 750 kgs) of organic waste**. They measure **3.5 ft L x 3.5 ft W x 4 ft H**. The Eira model is designed to allow more aeration through aeration pipes and narrow vertical vents along three sides while the Eartha model is enclosed with vents on the surface for aeration. Both composters, however, have the same processing capacity.



Figure 7 : Eartha model lane composter at Kasturba Nagar (**left**) ; Picture showing the interior of the **Eira** composting unit with the PVC aerator pipe (**right**)

Why Lane Composting?

During the research phase of the We Segregate project, the team found that Chennai generates about 6000 metric tonnes of municipal solid waste per day, of which ~45% is biodegradable coming from residences, institutions and commercial establishments.⁴

The team also found that waste segregation levels were only around 20 - 25%⁵ resulting in mixed waste (biodegradable, dry waste and hazardous waste) being dumped together in dumpsites such as Perungudi and Kodungaiyur. Since the waste is mixed, any form of recovery or recycling of the material is practically challenging, resulting in dumpsites which emit GHG and other toxins.

Moreover, processing wet waste (composed of plant, vegetable, fruit and cooked food waste) has handling complexities due to rapid decomposition of the waste which leads to malodour.



4 Official estimates state the waste generated in tonnes per day is 6000 but actual estimates may be more, according to SWM field experts.

5 Official estimates would claim that this number is around 80%, but these claims are likely to be exaggerated.

Thus, processing biodegradable waste near its source, ideally in each home and if not, at the community level would overcome these issues, save on transportation and fuel costs thereby having a lower carbon footprint.

Given these factors, the decision for choosing a mobile / modular, in-situ, aerobic and thermophilic composting setup for community composting was a no-brainer, at Kasturba Nagar.

Further, setting up composters where they are visible to everyone provides a good opportunity to show the community, where their biodegradable waste goes and how it transforms. **In other words, the composter becomes an environmental nudge that instigates positive behaviour change.**



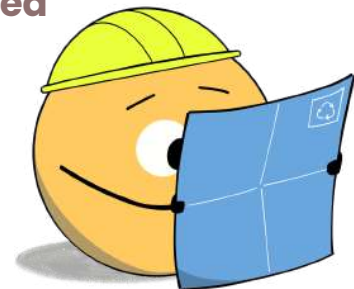
The “We Segregate” project title was conceptualised with the aim of changing residents’ segregation behaviour in the long term using three nudges - one of which was the lane composter. Through the installation of three lane composters on three different streets, along with a rigorous awareness campaign, the team wanted to show residents how biodegradable waste can be transformed into something useful, if they segregate. **The residents of Kasturba Nagar are thus able to witness (fig. 8) first hand, the full cycle of waste from consumption, waste generation, processing to reuse of the material (as compost / compost tea) in gardens belonging to local residents and schools).**



Figure 8 : Kasturba Nagar residents picking up compost made out of the community’s biodegradable waste

Pre-Planning

Assess quality and quantity of waste required



Before installing a lane composter, it is important to ensure that the quality of waste that would be fed to composters is biodegradable with no mixes of plastics, glass etc. If the community has not been initiated into segregation yet, then it would be best to first begin with creating awareness (detailed in chapter 3) and building the residents' capacity to segregate waste before setting up the composter.

The quantity of waste being generated in the community can also be assessed to get a clearer understanding of just how much waste is being produced. While it is difficult to estimate the exact amount of biodegradable waste generated per household, one may assume it to be around 700g per person.^{6,7} This figure can be cross-verified by checking with your locality's waste collector.

An approximation of the average waste generated per day per household can be calculated by estimating the total volume of each bin, the number of bins cleared each day and the number of times each bin is cleared per day. **The estimated average waste generated can also be assessed based on a self-reporting exercise done by 10 - 12 randomly chosen households.**

6 Online estimates vary, ranging from 200 grams to 700 grams per person per day. The Better India (2025), How Much Trash Does the Average Indian Produce Every Day?, <https://thebetterindia.com/421925/daily-waste-india-how-much-trash-one-person-creates-types-of-waste-earth-day/>.

7 Ministry of Housing and Urban Affairs. (n.d.). Guidelines For Preparation Of Detailed Project Reports And Selection Of Technologies For Processing And Final Disposal Of Municipal Solid Waste Using 12th Finance Commission Grants 2005-2010, <https://mohua.gov.in/upload/uploadfiles/files/93.pdf>.

While it would be important to understand how much waste is generated by the community, **it is not necessary to install as many composters as required to process all the waste.** Several factors such as financial resources, human resources, space, etc. may determine the number of composters that can be installed at present.

Therefore, it is recommended to start with a number of composters that best suits each community's context and constraints. Even if a community starts with just one lane composter, it would still be useful for awareness building and for diverting some of the biodegradable waste away from dumpyards (even if it is in limited quantities).

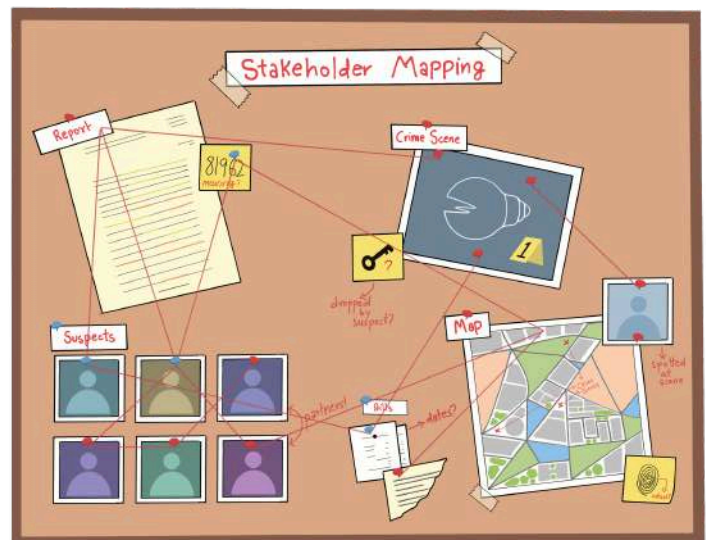


The We Segregate team recommends using lane composters in pairs. This is so that when one composter is filled, biodegradable waste can be diverted into the other. **This will ensure continuity in composting.**

Identify stakeholders

Early in the process, it is critical to identify the different stakeholders / people / organisations involved in SWM in one's locality. If it is a gated community, then the key stakeholders are likely the building association, residents, domestic help security, housekeeping staff, the building management and possibly a waste collection company, if relevant. If it's an open street, the local government and waste collection company appointed by the city are also critical stakeholders.

Identifying these different actors and the roles they play with respect to SWM in one's community is crucial to ensure that everyone is on board from the beginning and understands their new roles and responsibilities.





An area like Kasturba Nagar, where the We Segregate project is implemented, comprises about 10 to 12 streets. Most of these streets are residential with a couple of commercial stretches intertwined. Therefore, the project team had to interact with multiple building level associations, the local councilor (elected representative), Urbaser Sumeet's⁸ BoV drivers (who collect the waste from every building), Urbaser Sumeet management, the project's funders and the local government i.e. GCC at the zonal level and at the level of the City Commissioner.

Additionally, ROKA also identified domestic help and building security guards as stakeholders for We Segregate. Both these groups play a critical role in waste segregation - in most homes, the domestic help is in charge of clearing the household waste while this duty falls on security guards at the apartment level. The security guards (**fig. 9**) also play the dual role of serving as the team's eyes on ground - they know who drops what kind of waste, when and how. They also know which domestic help works in which individual apartment. Therefore, it was important to sensitize these two groups to the project's activities.



Figure 9 : Mr. Sekar, who works as a security guard in an apartment in Kasturba Nagar, checking the temperature in the compost pile

8 GCC has partnerships with private contractors like Urbaser Sumeet and Ramky who collect municipal solid waste from zones 9 to 15 and zones 1, 2, 3 & 7 respectively, through a door to door collection system.

Site visits and expert consultations

Once the decision on the number of lane composters to be set up is made, visits and conversations with other communities who have successfully implemented community composting would be useful. These visits can help to understand practical challenges related to community level composting, how to work with residents and other stakeholders, how to utilise the harvested compost etc.

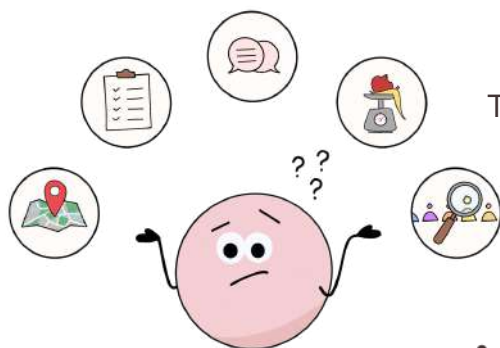


The We Segregate team visited Bangalore (**fig. 10**) to witness other successful community SWM models to understand the practical challenges related to community level composting, residents involvement and productive usage of the composting process's output.



Figure 10 : Lane composter at SwachaGraha Kalika Kendra in Bangalore (**left**) ; Discussions with the volunteer team of a community SWM project in Bangalore (**right**)

Develop an operational plan



The next step is to prepare an operational plan. The following factors need to be considered while preparing the plan :

- Where will the biodegradable waste be collected from? How and by whom?
- How will it be transported to the lane composters?
- Who will add the collected biodegradable waste to the composters? This process will include mixing the biodegradable waste with brown matter (dry leaves / cocopeat) before deposition into the composter.
- Who will be operating / handling the composter and helping with harvest? This will include occasional aeration of the pile, sieving the compost and packing it in sacks / bags.
- What would be the financial implications of running the composters in the short, medium and long term? Does the organisation / community have the necessary resources?
- If multiple composters are being installed, then the decision has to be made whether to use all simultaneously or one at a time. It is important to note that if all units are being filled simultaneously, then there might be a gap of several months where the units can not receive any more waste and will need to be left closed to allow for composting.



At Kasturba Nagar, **three lane composters were installed on three different streets**. However, the project team decided to **work with only one at a time** - unit 1 is filled completely with waste before unit 2 starts to receive waste. Similarly, unit 2 is filled completely with waste before unit 3 starts to receive waste. This ensured that the composting process was ongoing at all times. **By using this method, fresh compost can be harvested every 30 - 45 days, i.e. unit 1 would be ready for harvest when unit 3 is full, and unit 2 would be ready for harvest when unit 1 is full and so on.**

Composter Installation And Setup

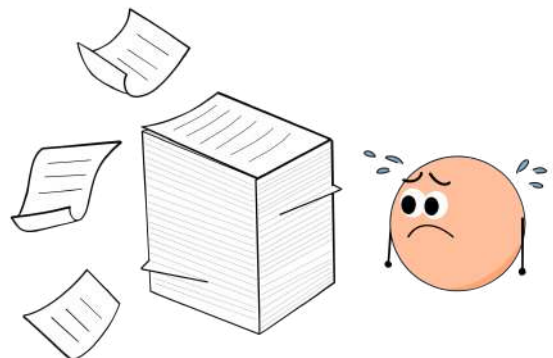
Identify a site and acquire permissions



Identifying the right site for the composter is critical. Some factors to consider while making this decision are :

- The composter needs to be visible. Installing a signboard identifying the unit as a composter will increase visibility;
- There needs to be enough space around the unit to allow for loading of waste, aerating the pile, storing cocopeat / dry leaves (for layering) and tools like rakes, churners, sacks, etc.;
- If kept on a public road, fencing around the composter (**fig. 12, page 40**) may be required to keep it from being vandalised / misused (by dumping mixed waste, for example);
- The unit should not obstruct traffic flow or pedestrian access;
- It should not be directly exposed to the sun;
- It should not be near a water inlet as maggots from the compost pile may spill over;
- It should not be placed near a street dumpster / public waste bin as people might dump other waste in it (as a force of habit or by mistake) despite any installed signage.

Once the site for the composter has been decided, the necessary permissions (in writing) to set up the composter in that site needs to be obtained. The authorities that need to grant permission would have already been identified during the earlier phase of stakeholder mapping.





The We Segregate team chose sites for the lane composters close to the home of at least one ROKA member (**fig. 11**). This was done to make it easy to monitor the set up and make sure it is not being used improperly – for example, for dumping trash.

Further, since Kasturba Nagar is an open cluster of streets, the project team had to get permission from Greater Chennai Corporation (GCC) and keep Urbaser Sumeet informed of the project. This process involved the project team submitting a letter to the GCC Zone 13 office with details of the proposed sites chosen by the team, the scope of the project and how it may impact the public waste collection / processing system. Following the submission of this letter, a site inspection visit was made by engineers from GCC who provided their suggestions and approved the chosen sites since these met with their specifications. Post inspection, the project team followed up with top level GCC officials (Commissioner, Deputy Commissioner SWM, Chief Engineer) with face to face meetings to get the official letter of permission in hand. **This entire process took the team about three months.**

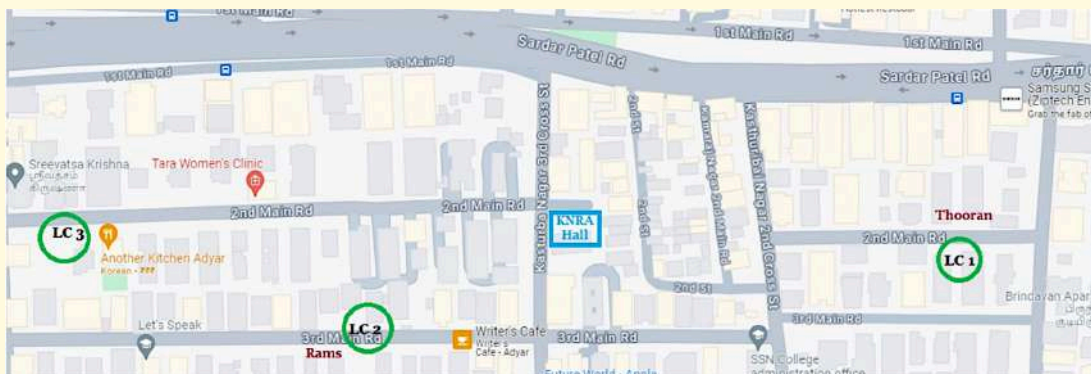


Figure 11 : Map showing locations of the 3 lane composters in Kasturba Nagar - circled in green and labelled LC1, LC2 and LC3

Order and install the composters

The next step is to order the composters. As a rule of thumb, composting is better done in pairs. Hence it is advised to order at least two units which then allows the usage of one unit to receive waste while the other is full and left closed to undergo composting.

In Chennai, there are several waste management firms that supply community composters such as **Daily Dump**, **Nilayaan Earth** and **Namma Ooru Foundation**.⁹



For the We Segregate project, the team chose two different models of composters, Eira and Eartha, from Endlessly Green.¹⁰ These units were chosen because :

- They were tried and tested in other sites and had worked well;
- They were compact and needed only a 4ft x 3ft space;
- The units had lids which could be locked. This was important since they were going to be kept on public streets and could be misused (to dump mixed waste).

⁹ Links to company websites are provided in the 'Additional Information' section.

¹⁰ A private waste management solutions company based in Bangalore.

The reason for choosing two different models was primarily to experiment with the efficiency, capacities and operation of the composters (**fig. 12**). More relevant information about each model can be found on the Endlessly Green website (provided in the 'Additional Information' section).

Initially, in an attempt to cut logistics costs, the project team looked for local fabricators. But the team found that, given the absence of the necessary design knowledge, hiring a designer cost nearly as much as buying a ready-made unit.



Figure 12 : Anterior view of the **Eira** (left) and posterior view of the **Eartha** (right) lane composters in Kasturba Nagar, Adyar. The **Eartha** composter (**left**) is seen here inside a mesh enclosure made of metal. **The metal wire mesh enclosure acts as a protective measure to prevent misuse of the unit as well as a way to secure any extra tools. Other tools needed for the composting process are detailed at the end of this chapter (on page 56)**

Procure brown matter

For the composting process to be odour free and efficient, the ‘green / biodegradable’ waste or kitchen waste needs to be layered with ‘brown’ waste i.e. cocopeat, saw dust, shredded cardboard or dry leaves. Therefore a constant supply of one or more of these materials is required.

Dry leaves can easily be collected for free from the local vicinity, nearby gardens, fallen leaves on the street and stored in a simple wire mesh tower near the composter (**fig. 13**). While initially, cocopeat would need to be purchased,¹¹ dry compost from previous harvests can be used in place of brown matter in layering with the waste for subsequent compost batches.



For the We Segregate project, cocopeat was initially sourced from Endlessly Green and arrived along with the composters. After this supply ended, the team then sourced it from GCC and made sure to start saving some compost for layering in subsequent batches. The team also ensures that dry leaves are collected from the streets and stored in a wire mesh tower (**fig. 13**), for layering.



Figure 13 : Eira lane composters and dry leaves storage at Kasturba Nagar. A lock on the lid of the unit can also be seen here. The composting unit is kept locked in between layering and waste deposition to prevent misuse like dumping mixed waste

¹¹ Generally, cocopeat can be purchased in bulk from plant nurseries, farms, online stores selling gardening needs, etc.

Waste Collection And Processing

The composting process involves the following steps :

- The collected organic waste is checked to remove contaminants (**fig. 14**) like uncut fruits, food in packets / containers, paper, cardboard and coconut shells;
- Cocopeat and dry leaves are added as the first layer into the unit;
- The organic matter is mixed with cocopeat and a powdered microbial culture;
- This mixture is then dropped into the unit on top of the dry leaves layer (**fig. 15, page 44**);
- The top is finished off with another layer of dry leaves / cocopeat;

It is important to close (and lock) the lid of the composter once these steps are done.



Figure 14 : Coconut shells, plastic packaging and other contaminants being removed from collected organic waste prior to mixing it with cocopeat and dry leaves

From the first round of adding biodegradable waste to the composters, each unit (irrespective of make) typically takes 60 - 65 days to harvest.¹² It can take longer if the weather is cooler and there are rains.

As the waste composts, the composting process produces a brown liquid called compost tea or leachate. The tea, which is rich in nutrients, can be diluted (one part tea to 15 parts of water) and used for watering plants.

Compost tea should be drained once in a while from the composting unit (depending on the weather). Composters are usually fitted with a tap at the bottom edge of the unit to drain out the tea. If not, a drainage provision in the form of holes or a tap may need to be created. The quantity of tea produced will vary depending on the weather and the composition of the waste collected i.e., if the compost has more wet content (meat, fruits, food) than dry content (leaves, peels, cocopeat) then more of the 'tea' is produced.



In Kasturba Nagar, waste is collected by Urbaser Sumeet's BoV drivers. Everyday, they ensure that a portion of the segregated, biodegradable waste collected from each of the three streets (a little over 1000 households) is transferred to **bins near the composter**. These bins are medium sized trash bins kept exclusively for this purpose, near the lane composters (**fig. 15**).

The deposited waste is then mixed with brown matter, microbial culture and layered onto the existing compost pile in the composter. This daily task is carried out by a paid labour personnel who has been hired and trained by the team. Their duties include removing contaminants, mixing cocopeat with the 'biodegradable / organic waste' and adding it to the composter (**fig. 15**).

12 There are some, newer composting models available in the market that boast a shorter turn-around time (of 60 days or less). These models typically have a separate opening at the bottom to access just the bottom most layer of the compost pile, allowing users to partially harvest the compost while leaving the top most layers (with fresh waste) undisturbed.

Approximately 20 to 25 kgs of waste is fed to a composter each day till it gets full. The rest of the segregated, biodegradable waste is taken to the nearby GCC micro composting facility or bio CNG plant.



Figure 15 : (Clockwise from top left) Bin used to store the collected biodegradable waste (bright green trash bin kept near the composting unit) ; Ms. Revathy, the paid labour personnel, mixing organic waste with cocopeat ; Ms. Revathy layering organic waste on the compost pile

In addition to layering the waste, periodic aeration is also essential. It must be done at least twice or thrice a week in order to have a homogeneously dry, end product.



Aeration is essential throughout the year and to maintain consistency, the project team roped in community volunteers, in addition to the paid labour personnel, to perform this crucial step (**fig. 16**).



Figure 16 : (Clockwise from top left) Closeups of the crank-twist tool ; Community volunteers using the crank-twist to aerate the compost pile

Harvesting The Compost

After 60 - 65 days, the compost would typically be ready to harvest. Compost that is ready will be :

- More or less odourless with a slight earthy smell;
- Crumbly but not too brittle and dry;
- Slightly moist;
- Colored dark chocolate brown (like brownies!).



If the harvested compost is too wet, it can be aired out for a while before use (**fig. 17**).

The harvest may be freely distributed (**fig. 17**) or sold at a small cost to residents. Availability of compost can also be advertised through local WhatsApp groups if there is enough to spare for other communities. Before each harvest, messages about the upcoming availability of fresh compost can be sent out to residents and then others, if required.

Harvesting the compost involves a lot of physical work (**fig. 17,18**) and will require more than one person to help with removing the compost from the unit, drying it, sieving it and packing the compost in bags for distribution.

Once the harvesting is complete, the composters can then be hosed down and cleaned if needed.



In Kasturba Nagar, the team wanted to make the entire harvesting process also zero-waste. Therefore, those who wanted compost were asked to bring their own sacks / bags. For others, sacks were acquired from the local kabbadiwala. Further, for drying out moist compost in the sun, old advertisement banners were utilised (**fig. 17**). These banners are diligently cleaned and stored for reuse in subsequent harvests.

The team also makes sure to clean the composters once in 180 days or after three composting cycles. The unit is cleaned by hosing it down (**fig. 18**) to remove debris and dirt. The composters are then left to dry out before resuming the composting process once again.



Figure 17 : Harvesting compost from the **Eartha** unit (**top left**) ; Closeup of the **Eartha** unit opened up for harvesting compost (**top right**) ; Front panels of the **Eira** unit removed for harvesting compost (**bottom left**) ; Harvested compost laid out to get rid of excess moisture (**bottom right**)



Figure 18 : Harvested compost being shared with residents (top row and bottom left) ; The Eira unit being cleaned after harvest (bottom right)

Recording Quantity - Waste And Compost

Like the soft plastics, it is important to record the quantity of biodegradable waste that is being sent to the composter(s) and the compost that is being harvested. This data is critical to estimate the impact from the project, not just for the organisations investing in it but also, for others who might be inspired to start a similar initiative in their locality.



For the We Segregate project, the amount of biodegradable waste going into the composters is being estimated by using the total capacity of the composting unit as a proxy.

Similarly, the weight of the compost is sometimes **guesstimated** based on the size of the bags / sacks holding the compost and the total number of such bags being distributed. When available, a weighing scale (**fig. 19**) is also used to measure and record the weight of the harvested compost.



As of September 2025, the team has been able to harvest over 3186 kilograms of compost since the project began in October 2023.

Figure 19 : Harvested compost being weighed Mr. Nawaz, a paid labour personnel hired to help with compost harvest activities

What Goes Around, Comes Around!

The lane composters have proven to be quite beneficial, not just by composting day to day biodegradable waste from households but also by **allowing community members to manage bulk food waste (fig. 20) generated in the aftermath of one time events like weddings.**

In July 2025, The Bartan Company,¹³ requested the We Segregate team to help divert food waste from a wedding event that they were organizing.

This collaboration resulted in close to **150 kgs of biodegradable waste being sent to the composters instead of being dumped.** The news platform, Better India, recently featured the aforementioned zero-waste wedding. Watch the full video showcase here : <https://thebetterindia.com/video/a-wedding-with-1000-guests-0-landfill/>

ROKA also notes how the community's residents are more willing to factor in waste segregation in their events as they find the lane composters convenient and easily accessible to manage any collected biodegradable waste (**fig. 20**). In other words, the presence of such a decentralised waste management system **takes away some of the logistical difficulties in handling large quantities of waste.**

The compost from the lane composters is also a useful resource. It is being used by residents in their home garden. In fact, since May 2024, the team has been selling harvested compost to residents at Rs 15/- per kg to channel some funds back into the maintenance of the composters. The compost is also being used in a local government school's rooftop vegetable garden, where the produce feeds in to the mid-day meals cooked in the school. **The vegetable garden was set up by the Chennai Resilience Centre through their Chennai Urban Farming Initiative (CUFI) and is maintained with support from ROKA.**



13 A private consulting company offering solutions focused on sustainability such as zero-waste events, workshops, household products for sale and utensils for rent.

Additionally, local organic farms like **Kazhani Native Farms** and **Kadamba Farms** have started to purchase the compost and compost tea in bulk (**fig. 20**) to replenish their soil's nutritive value thus ensuring healthy crop growth.

Therefore, with the waste segregation, composting, and use of compost in the gardens, especially vegetable gardens, We Segregate has allowed Kasturba Nagar residents to experience a **circular waste management system**.



Figure 20 : Flower garlands, banana leaves and food waste from a local event collected and deposited for composting in the lane composters (**top row**) ; Compost from Kasturba Nagar being used in Kadamba Farms (**bottom left**) ; Compost being used in the edible roof garden set up by the Chennai Urban Farming Initiative (**bottom right**)

Challenges

Consistent supply of well segregated biodegradable and brown waste matter :

A steady supply of organic matter must be fed into the composter to guarantee that the composting process is not disrupted and that no putrid, decomposing matter accumulates within. Mixing wet organic matter with adequate brown waste (leaves / cocopeat) prevents malodour, pests and excess moisture from accumulating.



Some of the local residents have formed the habit of collecting brown leaves (**fig. 21**) from their home compounds, specifically to be used in the lane composters, for layering. This support from the community helps to cut expenses by reducing the quantity of cocopeat bought and ensures that locally abundant waste material (brown leaves) is put to efficient use.



Figure 21 : Dry leaves being dropped into the metal wire mesh tower kept near the composting units for this purpose

Dependency on public waste collectors : If the composters are being set up in a public street then there is likely to be some dependency on the public waste collector to deposit biodegradable waste at the composting sites. Therefore it is critical that, during the pre-planning phase, the extent to which the project will depend on the waste collector is determined and their support is proactively sought. These meetings need to happen on a periodic basis so that operational issues such as dealing with new waste collectors, replacement personnel filling in for colleagues on leave etc are sorted efficiently.



In the case of We Segregate, the team worked with Urbaser Sumeet at two levels (management and on-ground team) from the pre-planning phase, to come to an agreement on the additional tasks that will be taken up by the BoV drivers. Factors such as - orienting the drivers to any new tasks, seeking open feedback and regular support from them was critical for the team. **To ensure better engagement, the entire process has been kept participatory and open.**

Additionally, the team recognises Urbaser Sumeet's on ground team's important contributions to the project and periodically honours them for their efforts. For the We Segregate team, maintaining a smooth, ongoing relationship with the ground team of Urbaser Sumeet is a high priority and crucial to the consistent success of the initiative.

Dependency on labour : Community composting is a labour intensive process but highly satisfying with the knowledge that one is making a small difference with their responsible management of waste. Labour would be required for collecting the community's biodegradable waste, mixing it with the 'browns' and adding it to the composters, compost pile aeration, harvesting the compost, collecting dry leaves etc. (fig. 22).

For handling regular composting activities like layering, the team has hired one permanent personnel. For occasional work such as harvesting compost, cleaning the enclosure, conducting simple repairs and maintenance on the unit itself, the team relies on extra paid help, as required.

In general, to ensure smooth operations and for the safety of the individual, it may prove beneficial to provide some form of identification in the form of ID cards, as needed.



Figure 22 : Ms. Revathy layering the compost with organic waste (**left**) ; Mr. Nawaz raking out fresh compost from the composter (**right**)

Weather's influence on composting :

- **Monsoon** : During rains, compost tea is produced in large quantities and needs to be drained out frequently to avoid moisture build up in the pile.
- **Summer** : Compost piles may dry out quicker and will need a sprinkling of water periodically. This lets out excess heat and ensures that the pile's conditions are conducive for thermophilic bacteria to thrive (**fig. 23**).
- **Winter** : Dry leaves must be stored during the non-rainy season so that it is available throughout the year.

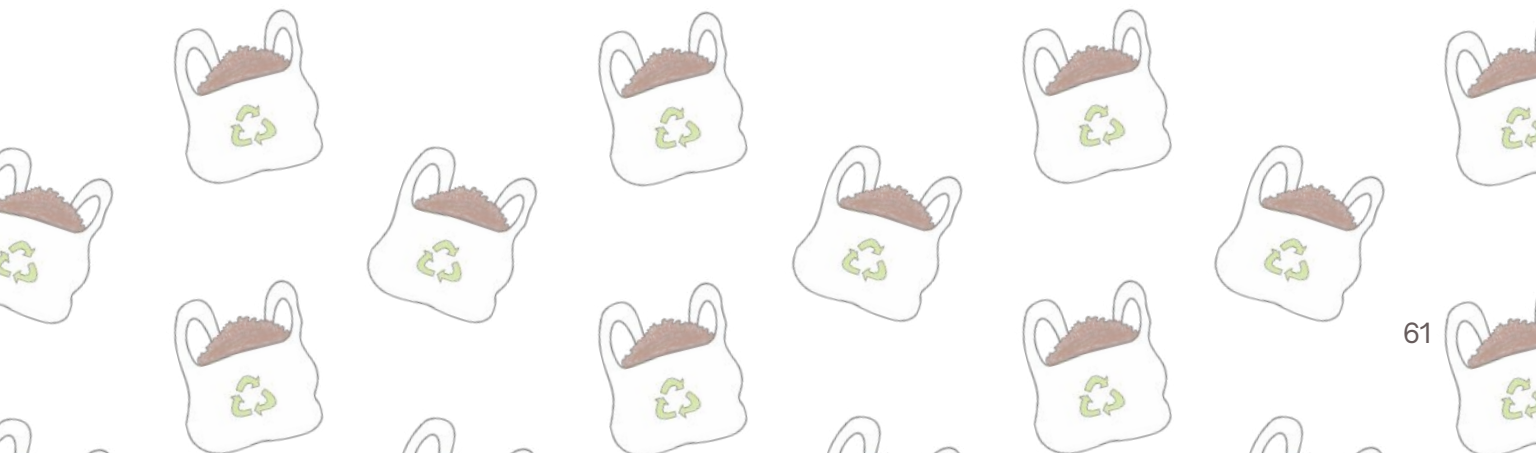
Community support : Projects like these are heavily dependent on the local community who will be contributing their waste. Therefore, they need to be on board from the beginning. While it is unlikely that one will receive 100% involvement from each and every community member, if there are some enthusiastic volunteers who are willing to lead and others willing to assist by following instructions, then the project can succeed.



We Segregate would not have been possible if the ROKA volunteers had not been passionate enough to start this project in their neighbourhood and sustain the effort. Further, community volunteers (**fig. 23**) who keep a watch of day-to-day operations, flag challenges and provide support when required are the backbone of We Segregate.



Figure 23 : Community volunteers helping to cool the pile by sprinkling water (**left**) and aerating the compost to let in more oxygen (**right**)



Frequently Asked Questions

What were all the additional tools required for the composting process?

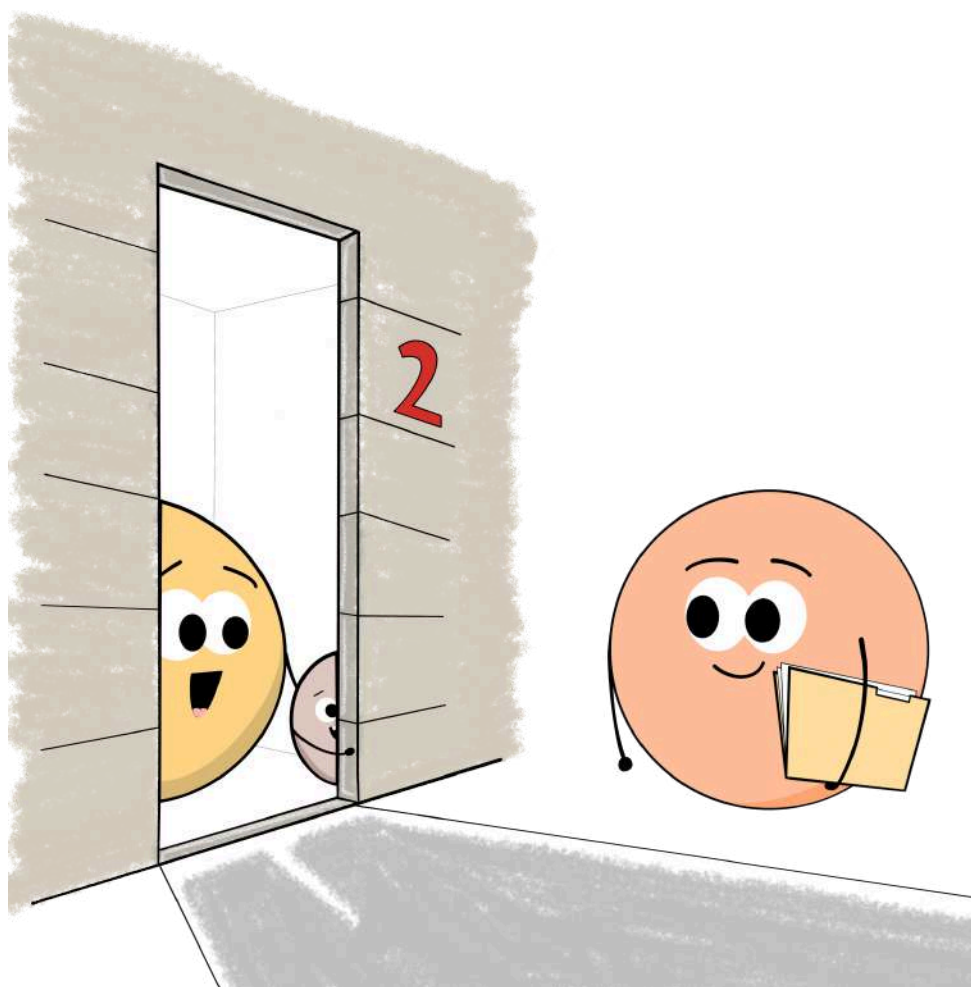
- Bins for collecting the wet waste;
- Rake and spade;
- Sacks for drying the compost. The project team also used old advertisement banners for drying the compost;
- Heavy duty plastic / metal buckets for mixing (**fig. 24**);
- Crank-twist / compost aerator;
- A mix of cocopeat that has live microbes and black soldier fly larvae. One can use plain cocopeat if this type of mixture is not readily available;
- (Optional) Microbial culture in powder form;
- Heavy duty gardening gloves or rubber gloves;
- Sacks for storing harvested compost, storing cocopeat, etc.;
- Funnel, cans and shallow containers to collect and store compost tea;
- Mesh sieve, which is a metal wire mesh nailed to a wooden frame to sieve compost (**fig. 24**). This sieve helps remove bigger debris / pieces of food that are not fully composted yet. This is an optional tool to have and can be used if a finer consistency of the compost is required. The bigger food debris, on the other hand, can be picked out by hand and put back into the composter for the next composting cycle.



Figure 24 : Heavy duty plastic bucket used to mix collected organic waste with cocopeat and to sift through the food waste to remove contaminants (**left**) ; Mesh sieve used to remove bigger clumps of undecomposed debris (**right**)

3. Dropping A **Line** To Residents

Building awareness and influencing behaviour



Why Are Awareness Campaigns Important?

In most Indian cities including Chennai, the waste segregation rates are extremely low. While official estimates suggest higher segregation rates of 80% or more in selected areas, on an average it is believed to be around 20 to 25%¹⁴ causing low levels of recycling and composting, and inefficiencies in waste to energy plants, leading to unscientific land-filling and open dumping with serious environmental ramifications.^{15,16} This is despite policies like the **SWM Rules 2016** and **GCC's SWM Bylaws 2019** that clearly mandate source segregation.

Therefore, there is increasing attention among academics, policy makers, and practitioners to think about how to change citizen behaviour to lead to greater adoption of sustainable waste management practices including segregation at source.

The **Government of India's Lifestyle for Environment (LiFE) campaign** is an effort towards creating a mass movement towards environmentally conscious lifestyles. As part of the campaign launched in **October 2022**, **Niti Aayog** has brought out a compendium of **75 ideas to promote LiFE** which includes the We Segregate project. The project is mentioned on **Page 100** of the compendium which can be accessed online using the QR code on the right.



14 *Circularity Informatics Lab. (2022). Circularity Assessment - Chennai, India. University of Georgia, Athens, GA, USA, Circularity Informatics Lab, University of Georgia, Athens, GA, USA, Circularity Assessment : Chennai, India, https://www.thecirculateinitiative.org/wp-content/uploads/Circularity-Assessment-Protocol_Chennai.pdf.*

15 *Yadav, V., M. A. Sherly, P. Ranjan, V. Prasad, R. O. Tinoco, & A. Laurent (2022). Risk of plastics losses to the environment from Indian landfills. Resour. Conserv. Recycl., 187, 106610.*

16 *Vaverková, M.D. (2019). Landfill Impacts on the Environment—Review, Geosciences, 9(10). <https://doi.org/10.3390/geosciences9100431>.*

Research on SWM and segregation behaviour highlights that residents need to be targeted at the individual and community level, for holistic and long-term behavioural change to take place such that waste segregation becomes a second nature. Literature also suggests that for sustainable behavioural transformation, there is a need to focus on increasing people's capabilities (e.g. awareness / knowledge) and available opportunities (e.g. infrastructure) which can strengthen human motivation, ultimately translating to pro-environmental action.^{17,18,19}

This inspired the We Segregate project to combine awareness building with infrastructure provision to encourage residents to segregate and recycle / compost their waste.

In fact, for any physical SWM infrastructure i.e. setting up a composter or providing different coloured bins, to have a long lasting impact, it is important for one to plan for a simultaneous and sustained awareness campaign. The campaign can include the use of different tools such as WhatsApp and other social media platforms, in-person events, site visits etc.



Since the aim of the We Segregate project was to bring in **long term behaviour change** in waste segregation behaviour of residents in three streets of Kasturba Nagar, the interventions were also planned accordingly. Installing

17 NITI Aayog. (2021). *Policy Guidelines Promoting Behavioural Change for Strengthening Waste Segregation at Source*, <https://www.niti.gov.in/sites/default/files/2021-12/PromotingBehaviourChange-forStrengtheningWasteSegregation-at-Source-PolicyGuidelines.pdf>.

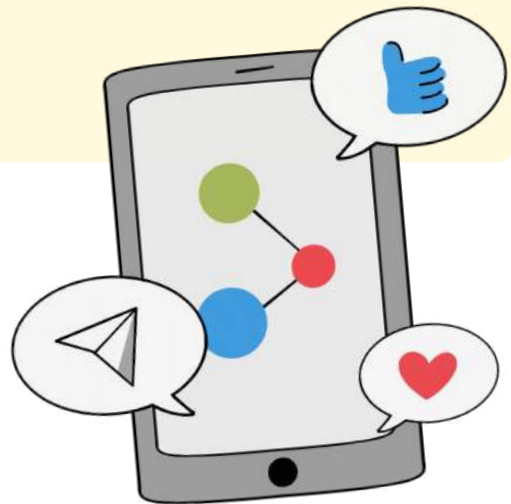
18 West, R. & Michie, S. (2020). *A brief introduction to the COM-B Model of behaviour and the PRIME Theory of motivation*. Qeios. <https://www.qeios.com/read/WW04E6>.

19 Raghu, S. J., & Rodrigues, L. L. (2021). *A Concept of Solid Waste Management Behaviour in India—A Solution towards Environmental Sustainability*. *Calitatea*, 22(183), 155-162.

lane composters would provide residents with the opportunity to see where their biodegradable waste goes and how it transforms into a valuable resource which they can use. Installing PtP hooks and the collection / pickup arrangement with BBFC and Spreco would enable residents to segregate their soft plastics, see how it is processed and what it is turned into. **While the awareness campaign would help to convince residents to segregate their household waste through the opportunities provided.**

Thus, in Kasturba Nagar, the project team prioritised keeping **a constant open line²⁰ of communication** with the residents. The team did this using both digital and in-person channels. **The main aim of the messaging was to gently coax residents to segregate biodegradable waste and punch their soft plastics regularly, so that these habits become a part of their daily routine.**

Face-to-face interactions on a weekly basis proved especially useful for residents to interact with the project team and vice versa. These interactions enabled both parties to foster trust and transparency. **Building camaraderie** with the residents also meant that any other social messaging like in-person events or online communication proved even more effective with residents sending their suggestions or participating in the events along with their friends / families.



20 Drop (someone) a line : to send (someone) a brief note or message.

Developing Campaign Content

Since the primary goal is to change waste segregation behaviour, the campaign should focus on why people need to segregate, what to segregate and how to do so.

Why is it necessary to segregate?

Before providing instructions / guidance on what to segregate and how, it is important to convince residents why their effort is necessary.



While approaching residents, rather than linking better solid waste management to complex topics like climate change, it would be more effective to relate it to everyday issues that residents may face.

For instance the following arguments may be put forth :

- Waste, if not managed properly can become a public nuisance with overflowing bins attracting dogs, bandicoots, mosquitoes and other pests, posing a threat to public health.
- Poorly managed / segregated waste dumped in dumpsites like Perungudi and Kodungayur in Chennai results in severe air / water pollution and dumpsite fires.
- Waste haphazardly dumped on the streets and / or those from overflowing bins is carried into drains and rivers, eventually clogs storm water drains and results in local flooding.
- Only if waste is clean and segregated, can it be used for recycling.

- Discarding unsegregated waste creates unsafe working conditions for BoV drivers / sanitation personnel and other waste workers since it compromises their health (**fig. 25**).

Adding statistics and data to each of the points above would further strengthen the argument and help convince residents about the seriousness of the issue. **Such as the fact that, in 2015 the Greater Chennai Corporation cleared 1.2 lakh tonnes of waste or 25 days worth of the city's waste from drains, streets and waterways!**



Figure 25 : A waste picker, shown here, in unsafe conditions (inside a street dumpster) searching for recyclable material to sell in exchange for cash. Street dumpsters are often used to dump mixed waste and one can encounter sharp objects, rotting food and other hazardous material which is dangerous and even fatal to the people exposed to it.

What to segregate and how to do so?

Households typically and regularly generate a minimum of three categories of waste :

- **Biodegradable waste**, which consists of cooked and uncooked food waste, paper (brown paper bags / sheets without ink prints), flowers, leaves, etc. This category can be composted at home or discarded in a designated 'green' bin.
- **Dry waste**, which includes all recyclables such as printed paper, newspaper, glass (unbroken containers), different types of plastic, coconut shells, old clothing, tablet strips, aluminium foil , tin cans, cardboard, etc. Dry waste can also be collected and stored in large quantities to make it easy for transportation. However, any food / liquid residue needs to be cleaned thoroughly to avoid pests and/or bad odor and to ensure that the material can be effectively recycled / repurposed. Dry waste is discarded in 'blue' bins.
- **Domestic hazardous waste**, which refers to waste that has been contaminated by human discharge such as used sanitary pads, hair, nail clippings, cotton swabs, razors, syringes, expired medication and broken shards. Dust swept up due to daily cleaning activities should also be discarded as domestic hazardous waste (**fig. 26**). This category should be discarded in a sealed bag (to make it safe for handling by the waste collector) and then discarded in 'red' bins.



Apart from these items, households also periodically generate other kinds of waste such as electronics (also known as e-waste), mattresses / pillows, shoes, furniture , ceramics, x-rays etc. which can be collected and given to authorised waste aggregators. A list of waste management companies / aggregators along with their website information can be found in the 'Additional Information' section.



Figure 26 : Waste segregation chart used for the We Segregate project's awareness messaging, Source : Mr. Ravi from Trellis South Flat Owners Welfare Association, Vadapalani, Chennai

Urbaser Sumeet and GCC also recommend that households segregate waste in three ways - into dry, wet (bio degradable) and hazardous waste. They have been creating awareness on the same through their social media channels.

Social media post on waste segregation by Urbaser Sumeet



Pushback from residents

Often, when the topic of waste is broached with residents, one may encounter resistance from some of them. The following are typical responses / questions from residents when they are requested to segregate their waste and some suggestions on how these can be answered :

- **“I do it at home but our domestic help mixes it up while discarding / I have told the domestic help to segregate but they don't listen.”** : This problem can be easily solved by breaking the trash disposal effort into parts based on the categories generated in the home. For instance, if the resident is already segregating their waste into dry, wet (biodegradable / organic) and hazardous categories, then only the wet waste bin would need frequent emptying whereas the dry and hazardous waste could be discarded on dedicated days. This way only one category of waste is discarded on any day. Designating one, easily discernible, category of waste to the domestic help prevents any space for mistakes or a lackadaisical attitude (often due to fatigue and strain from housework).
- **“I don't have time.”** : It takes only 30 seconds (or less) to discard waste in the right bin, if the system already exists. Creating a system could be projected as a legacy investment, one that not only consolidates effort and saves time, but also protects the surroundings and creates a positive impact on the planet.

- **“I don't generate any / much garbage.”:**

To understand the kind of waste being generated at home, the resident can be probed about their day to day usage of items like medication, personal care products, household cleaning products and their shopping habits. After which the following questions may be asked :

- *How do you dispose of your beauty products or medications?*
- *How often do you sweep your home or clear out clutter? How do you dispose of the resulting waste?*
- *What do you do with your daily kitchen waste like egg-shells, fruit peels and milk packets? (one can provide examples of other staple items typically found in an Indian kitchen)*



- **“Yes I am doing it.”** (*but in reality they may not be doing so*) : First, make sure to commend their efforts and then gently probe further by enquiring into what categories they segregate, how they dispose of it, etc. The domestic help or watchman can also be enquired to cross verify the information provided by the resident.

- **“I don't see a point in doing it as the BoV driver is anyway going to mix it up after I give him my segregated waste!”** : This query can be countered by giving the resident more information. In the zones managed by Urbaser Sumeet in Chennai, for example, the BoV drivers from Urbaser Sumeet follow a certain system to collect the waste. If the waste provided from the building is segregated - it will be transferred to separate containers and taken for recycling. If mixed waste is provided, it will be put in containers with other mixed waste.

- **“I pay taxes. It is the responsibility of the government to make sure things like waste segregation is being done.”** : To counter this response, explain to the resident that, while governments are working on large scale policy and systemic changes, civic action and individual action are critical to support any system to make it successful. Therefore, they should not be passive.

- “Why should I rinse and separate out soft plastics from other recyclable / dry waste? It is extra work.” : This resistance about making the 'extra effort' of separating out soft plastics may be addressed by detailing the negative impact of low value waste leakage in the local environment and how their collected soft plastics will be recycled. The idea is to give residents an exact picture of the tangible and positive impacts that are being created due to any extra efforts that they are undertaking. The We Segregate team also used a brochure (fig. 27) to help residents understand the consequences of their actions. It included facts and figures from the city, illustrations of where a resident's waste would end up if not segregated and how it would impact them.



Figure 27 : Printed brochure used in the We Segregate project for imparting awareness to residents in Kasturba Nagar



Waste segregation awareness brochure

Planning An Awareness Campaign

For any awareness campaign to be successful, it is important to plan the different components and develop a goal oriented execution strategy. Some factors to consider while planning are :

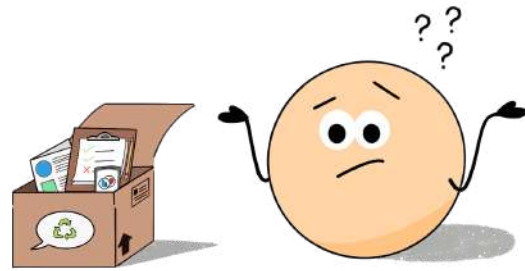
- What are the goals of the campaign?
- What are the demographics of the main target group? E.g. age groups, income levels, family size, number of earning members, etc.
- What are the key messages that need to be promoted?
- What would be the frequency of messaging?
- What tone of language would be employed in the various messages? E.g. casual, fun, thought provoking, serious, etc. How can the language be leveraged to catch the audiences' attention?
- What financial and human resources are required for the awareness campaign? Do they need to be trained? If so, how will this be organised (where and in what frequency)?
- How would data be monitored and collected for impact measurement?



We Segregate was conceptualised with deliberate measures that were focused on increasing the capacity of residents to segregate by providing them with opportunities to do so via PtP hooks and composters. A sustained awareness campaign played a critical role in increasing this waste segregation capacity. The goals of the awareness campaign for We Segregate were :

- **To educate residents about source segregation** - why, how and what to segregate so that uncontaminated waste could be diverted to designated bins and the PtP hooks;
- **To inspect the common bins in each building and flag compliance as well as non-compliance.** This monitoring helped to ensure proper segregation is happening in practice;
- **To provide an opportunity for the project team to monitor progress of segregation behaviour of the residents through one-on-one interactions.**

Modes Of Communication



Once the goals of a campaign have been set, it is important to identify what are the different tools that can be used to spread the message. The selection of these tools / platforms would depend on several factors such as :

- Who is the main target group?
- Would certain messages lend themselves better to certain kinds of tools? For example, to convince people why they need to segregate, a visit to the local dumpsite might be more effective than sharing a generic picture depicting a turtle somewhere in the ocean eating a plastic bag.
- Are any financial resources required for the use of the tools? If so, are they available?
- What would be the frequency of communication?

Some common tools / platforms that are typically used are WhatsApp, social media like Instagram and Facebook, in-person communication (rallies, DtoD visits, events) and printed material like brochures / posters (although, print material does have the potential of generating more waste!).



For We Segregate, the target audience was middle and upper middle income residents of varying age groups and their household's domestic help. Therefore, a combination of tools were used such as :

- In person communication including DtoD campaign and live events;
- Print material;
- Online communication through Instagram, Facebook and WhatsApp.

The following section illustrates some of the most common communication tools and how one may use them for changing segregation behaviour.

In person communication

In person communication is critical in the initial stages to bring about behaviour change. It can take the form of DtoD visits or live events like rallies, meetings, group discussions, waste collection drives and so on. While DtoD interactions are time consuming and resource intensive, they are a great way of passing on the message. They give an opportunity to encourage people to talk through their segregation problems and explore potential solutions while building a transparent and trusting relationship with the community.

Depending on the number of households to be covered, two or more personnel may be required for DtoD interactions. These personnel may be given a certain number of households or a certain route to complete every day with their experiences being documented on a daily basis.



For the We Segregate team, daily DtoD interactions were important not just for creating awareness but also for recording any change in segregation behaviour. Therefore, the project employed two people, in a part-time capacity, to visit each residential building in the project area and interact with residents, building association secretaries, security guards and the domestic help. During these visits, the team also checked the common bins in the buildings and documented their observations. Each resource person (otherwise known as field intern) was allocated a fixed route and was to cover as many apartments as they could during their shift.

Apart from the regular DtoD interactions, the field interns also conducted BoV walks, i.e. interns walked along with the area's designated Urbaser Sumeet BoV driver (conservancy / sanitation worker) as they collected waste from each building along specific streets. In Chennai, there is no penalty for not segregating one's waste.

Therefore, accompanying the BoV driver (**fig. 28**) who is tasked with door to door collection of waste was a great way for the We Segregate team to understand ground realities of segregation. These visits produced greater results with residents who were not complying in two ways :

- BoV drivers would show evidence of unsegregated waste that had been discarded and,
- The project team could now identify non-compliant residents and nudge them to strengthen their efforts.

Further, in case of any resistance or lapse in segregation, team members responded by taking photos and sending them as evidence to the building secretary in the particular apartment for further action.



Figure 28 : Photos, taken by field interns, showing BoV drivers collecting waste from apartments in the project area in Kasturba Nagar

Other kinds of in-person communication such as rallies, meetings, fun events like children’s theater, zero-waste cricket matches, etc. can be periodic interventions planned every one or two months depending on requirement and budget.



The We Segregate Team organised several in-person events centred around waste segregation and sustainability with assistance from community volunteers. These events were designed to be completely zero waste, with even the medals and prizes made of recycled / repurposed materials. Here is a list of events conducted :

Waste Rally : In November 2023, a rally was held in the streets covered by the project to promote source segregation (**fig. 29**). The rally was supported by BBFC who decided to give certificates to all participants and provide placards for participants to carry. The project team was accompanied by enthusiastic young residents who were happy to join this worthy cause.

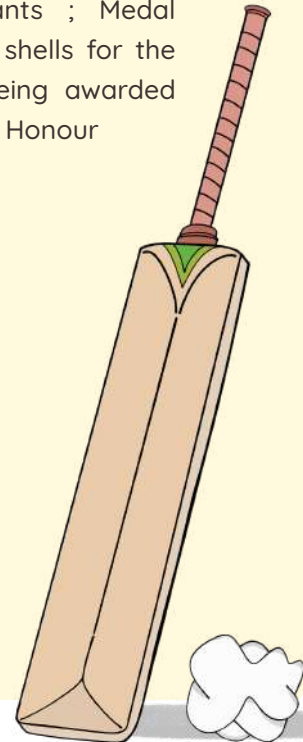


Figure 29 : Pictures from the waste rally

Cricket Match : In March 2024, the project team put together an interactive, fun cricket match to reach out to more residents (**fig. 30**). The match was held in a local playground and culminated in a prize distribution for the winners and a discussion on the importance of waste segregation. The event was completely zero - waste and the medals distributed to the winners were made from recycled coconut shells. The cricket match was a huge success with over 30 residents both young and old participating in the event.



Figure 30 : (Clockwise from top left) Cricket match participants ; Medal made from dry coconut shells for the winners ; Participants being awarded with caps by the Guest Of Honour



Community Feedback : Towards the end of March 2024 a discussion (**fig. 31**) was held with residents of Kasturba Nagar, to present learnings from the project thus far and discuss how residents can contribute to the project.



Figure 31 : Community residents engaging in a focus group discussion during the community meeting event

Waste Drive : In July 2024, a two day, multi-venue waste collection drive (**fig. 32**) was held across Chennai in over 10 public and private locations including the KNRA community hall. In addition to enabling residents to come drop their collected dry waste (consisting of over 13 categories of household waste), the event acted as an extension of the project’s efforts to create awareness on the importance of source segregation. As an added enrichment for drive participants, a street play and a children’s skit were also organised at KNRA Hall. About 7.6 metric tonnes of dry waste were collected over the two days of the drive including about 100 kgs of soft plastic. The collected waste was handed over for appropriate recycling to a local waste management company / waste aggregator. ROKA had coordinated with volunteers from the community for support during the event.



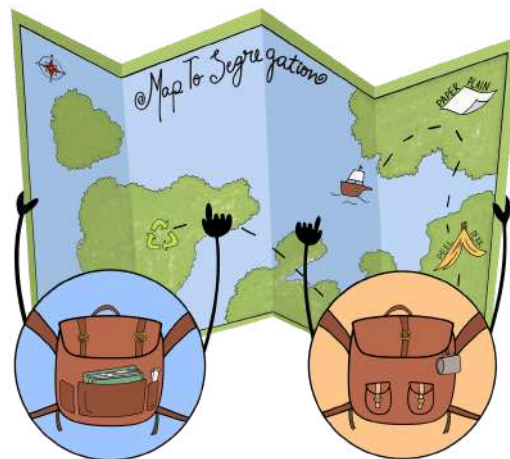
Video showcasing
waste drive event



Figure 32 : Pictures from the waste drive event



Printed material



Printed material can be a useful tool to carry when conducting DtoD visits as some residents may want / need a more accessible version of soft copy material in the form of physical handouts. For instance posters, illustrating the different types of waste that should go into different bins, are quite useful. More detailed messages about why one should segregate, the impact of unsegregated waste, end result of recycling waste etc. would be better suited for online media with a few printed copies in hand for quick reference. However more printing does require the use of more paper and ink and lead to wastage. For instance, using recycled paper or paper embedded with seeds would match the spirit of the intervention itself (waste segregation for effective recycling and a healthier environment).



As an accompaniment to the in person communication, the We Segregate project showcased / distributed print material, at events and during door-to-door visits, in limited quantities.

- **Puzzles (fig. 33)** were designed for the neighbourhood children which included a BINGO game where participants had to cross off waste items they found in their household trash.
- **A brochure (fig. 27, page 67)** was prepared by the project team which is currently being used to visually communicate the types of waste categories and appropriate segregation methods for the waste.

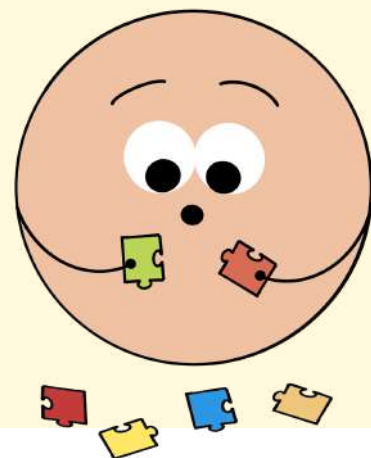
- A poster (fig. 3, chapter 1, page 20) illustrating what kinds of material can be punched in the PtP hooks was placed near the hooks as an easy visual reference for residents.



Figure 33 : Crossword and BINGO puzzles with entries by children living in the project area



Waste segregation awareness brochure



Online communication

Online communication tools like WhatsApp, Instagram or other social media platforms are also important and cost effective tools which can be utilized to great effect for imparting awareness. Creating dedicated, reliable and trustworthy social media content to nudge segregation behaviour will have a large impact in the community. Further, it is important that the discourse on waste is kept alive and sharing information about waste (even repetitively) will help this cause. Think of it like the Ministry of Health and Family Welfare's public advisory for anti-smoking and dangers of alcohol consumption, that comes up before and in between movies.



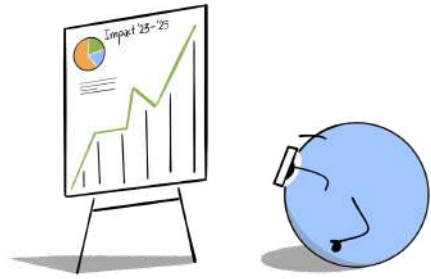
For We Segregate, dedicated social media content consisting of posters, infographics, photographs, short reels and videos were created on a regular basis to enable visual demonstration of :

- The project's behind the scenes activities like composting, plastic waste collection, etc.;
- Clarifying frequently asked questions / concerns;
- Waste categories and segregation methods;
- Comics on waste management;
- Waste diversion impact of the project;
- Team showcase, and more!



Video showcasing
the compost harvest

Measuring Impact



Measuring the impact of an awareness campaign is quite challenging. Usually such data is based on self-reported survey responses which need to be cross-checked via additional means. For instance, team members may observe and record data on the state of the bins during the DtoD visits or BoV walks to understand ground reality. If one building self-reports that they are segregating 100% through an online survey, this statement can be cross-verified by the ground team during the door-to-door interactions.

As such, impact of a project can be measured through surveys (online or offline), direct inspections of bins and through interactions with waste collectors. In case, resources are not available for large scale surveys, interviews or focus group discussions with selected households and conservancy workers may provide a clear understanding of the impact of any awareness building activities.



Assessing Impact Of We Segregate In Kasturba Nagar

Methodology : Impact on behaviour change for We Segregate was measured through a sample survey with residents and through observations recorded by the team that conducted the door to door campaign. Along with their campaign activities, the team surveyed (using KoboToolbox) randomly selected residents in buildings across the three streets about three to four months after the project began.

Simultaneously, the team continued to record their observations of interactions with building secretaries, watchmen, residents and inspected common bins in each building they visited, for six months. This observational data was also recorded using KoboToolbox.



KoboToolbox Website



We Segregate survey
questions on KoboToolbox

This entire exercise resulted in two sets of data - individual household level data on self-reported perceptions of project impact collected through the online survey and observational data recorded by the team at a building level.

The survey data was analysed using excel to derive simple histograms, bar and pie charts to describe the findings. While the day to day observational data was plotted on a graph over time since there were multiple data points for each building over a period of a few months i.e., several households / apartment buildings were visited multiple times by the door to door team over a time period. Based on the extent of segregation, the buildings were classified into three categories - 'Good', 'Improvement Required' and 'No Segregation'. The team tracked the movement of buildings between each category to determine change in segregation levels.

This data also allowed the team to recognize and reward residents who segregated their waste appropriately by giving them certificates of commendation. Between October 2023 and March 2024, 12 such residents were appreciated as '**Segregating Champions**' and were awarded with gift vouchers for an online shop selling sustainable and natural home necessities.

Some of the important results from the survey and DtoD observations were :

- An increasing trend in waste segregation, with more buildings and households following three way segregation over six months;

- Around 41% of respondents who answered the survey started segregating after the introduction of the project's interventions;
- Observational data was recorded from 98 buildings (nearly 80% of all residential buildings on the three streets), nearly half of which (48%) had completely mixed waste in their common bins in the beginning of the project. Whereas after five to six months, this percentage has dropped to 31%. Further, buildings that were doing a good job in segregating into three categories consistently, has increased from 37% to 54%;
- Approximately 66% of respondents who segregate their waste stated that the door-to-door awareness campaign had encouraged them to do so;
- Respondents engaged in some other eco-friendly habits apart from waste segregation, such as repairing broken possessions instead of buying new, carrying their own shopping bags and avoiding single use plastics such as cups, straws or take away boxes. This indicates that some level of environmental awareness is present and has been converted into habits by the residents' own volition.

Detailed report on
the survey findings



Please note that the unit of impact measurement might change based on the context. For instance, if impact is to be measured within a gated community then the number of households that are segregating vs those that are not segregating could be a tangible and measurable impact.



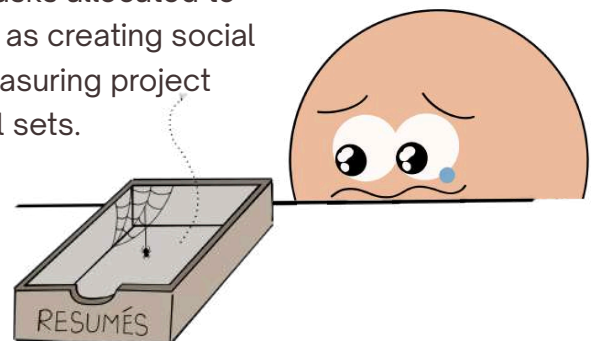
Challenges

Repeated nudging may be necessary before change is observed : Typically, some changes in behaviour is noticed only after a building / household is approached at least two to three times. This suggests the need for consistent and frequent long term interaction and follow up with residents.

Working with larger communities : Reaching out to a larger number of households (e.g. all homes in a large apartment block or a street) in the beginning may be difficult as there would be more residents whose behaviour needs to change. Therefore it is recommended to start with a smaller group. The We Segregate team learnt this important lesson while working on the three main roads, as two roads that had fewer households per building were more compliant than the other road which had more housing units per building.

Newly relocated residents vs permanent / long term residents : Sometimes long term residents who have lived in the neighbourhood for several years may be cynical and opposed to change. These residents should be approached with patience. On the other hand, it might be relatively easier to work with residents who have newly moved into the neighbourhood as they tend to be much more eager to comply with association rules and be responsible neighbours.

Finding appropriate DtoD resource people : Finding the right people to engage in DtoD activities can be difficult since it is monotonous and may seem to be a thankless job, especially when interacting with rude / unfriendly residents. Ideally, resource people may be found from within the community / neighbourhood or from colleges where students are required to spend a specific number of hours doing social work as part of their curriculum. Corporate Social Responsibility (CSR) programs might also be a potential source of identifying interested persons, although volunteers from these programs might be more interested in one-time activities like Waste Collection Drives or Beach Cleanups rather than consistent, long term engagements like a DtoD campaign. To make work enjoyable for the DtoD resource people, tasks allocated to them could include other project activities such as creating social media content, helping organize live events, measuring project impact, etc. depending on their interest and skill sets.



Frequently Asked Questions



What material did the persons going on Door to Door interactions carry with them?

- An informational brochure on why one needs to segregate, what the campaign is hoping to achieve including details about source segregation and its importance;
- A smartphone to record pictures of the segregation status, other observations and administer surveys;
- A pen and paper if any data is being recorded on paper.

What was the frequency of interaction with residents?

The frequency of resident interaction varied depending on factors such as the communication method utilised, availability of volunteers and project budget. In person events were organised once every three to six months. Social media / WhatsApp updates were sent out once a week and DtoD visits were conducted every week on weekdays for a few months at a stretch (DtoD visits were not conducted on Sundays and holidays). Apart from this, direct messages to address lapses in waste segregation were done regularly, as needed.

What has been the response to the door to door visits?

While the residents are usually friendly and cooperative, the DtoD team has had instances where residents have not been willing to listen and have been rude. Hired DtoD personnel would need to be sensitized to the possibility of encountering such rude residents and trained to handle these situations with patience and politeness. When encountered with uncooperative residents, the DtoD team would remind them that they are volunteers working in the interest of the collective environment and that it would be nice if the resident cooperates along with everyone else. If the resident is still resistive, the team would thank them for their time and move on to the next household.



Note From Residents Of Kasturbanagar Association

In waste management, it is recommended that wet waste should not travel long distances; rather, it has to be processed in-situ. Yet, our life at ROKA with waste management has made us travel wide and far!

This is the essence of what we are doing through the We Segregate project - sharing our learnings from managing waste in our community far and wide and serving as a holding hand to anyone interested in joining this journey with us. There is nothing more satisfying than the feel of run-through-the-fingers black gold, then there is that elation of seeing our community come together to manage their waste sustainably. This small success has rejuvenated us into working with other communities to bring them together to share this feeling.

Engaging with more stakeholders is paramount to pushing communities to take responsibility for managing their own waste. And, collaborations always help in bringing people and teams together to make daily operations smooth and seamless. Okapi Research & Advisory, Chennai Resilience Centre and ROKA (including other stakeholders like Spreco Recycling, Bisleri's Bottles for Change CSR, Urbaser Sumeet, Greater Chennai Corporation, etc.) are joyfully travelling the same path with us and we wish for other communities and people to join us in our quest to create neighbourhoods that holistically and sustainably manage their waste.

Civic movements are important in the realm of change and revolution and that is precisely what we are enabling in our work with waste management. We are often faced with questions and remarks that point at inconsistencies and unkept promises, but civic movements go beyond that and it is about citizens coming together to show the power of the individual in groups.

We have faced many challenges, doors slammed in our faces, people crossing the road to avoid conversations, but when we see good compliance to segregation and active resident participation in our projects, we are assured that we are on the right path.

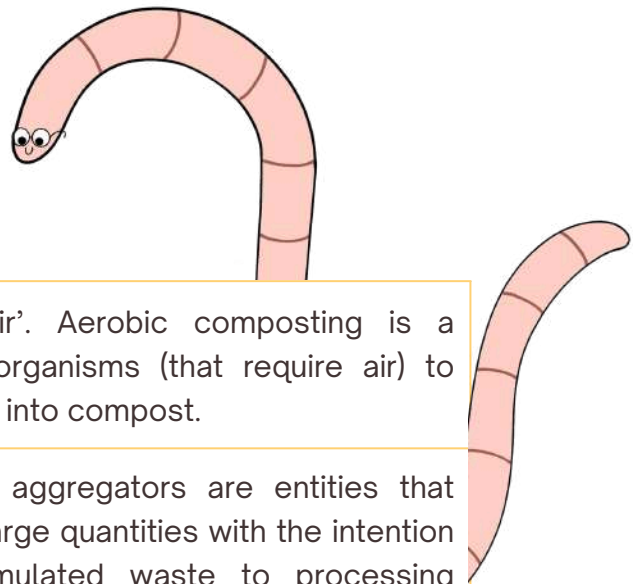
Beyond ups and downs in this journey, we march on steadfast, keeping in mind holistic waste management, sustainability and minimalism.

Saranya P

Janani Venkitesh



Glossary Of Terms



Aerobic Composting	<p>‘Aerobic’ means ‘with air’. Aerobic composting is a process that uses microorganisms (that require air) to break down organic matter into compost.</p>
Aggregators	<p>In the context of SWM, aggregators are entities that collect waste material in large quantities with the intention of channeling the accumulated waste to processing facilities or recyclers, for a price.</p>
Cocopeat	<p>A natural fiber derived from coconut husks. Due to its water loving nature, it is used in the composting process to absorb excess moisture and maintain a reasonable, semi - dry state within the pile.</p>
Conservancy Worker	<p>A person formally employed in collecting waste. In the context of Chennai, this term is used to refer to workers employed by the city’s private waste management firms, like Urbaser Sumeet, to collect everyday trash generated by the city’s residents.</p> <p>The term ‘Sanitation’ is often used interchangeably with the word ‘Conservancy’.</p>
Dry Waste	<p>Recyclable and non-recyclable waste material that does not readily decompose, prompting the need for specialized handling, processing and / or disposal of the material to avoid harm to the environment. Properly segregating this category of waste also ensures that any potential recyclability is realized, reducing the need for virgin raw materials and energy.</p> <p>Some examples of recyclable dry waste are : newspapers, magazines, cardboard, paper, metals like iron, aluminium,</p>

copper, steel, tin, glass, plastic, old electronics, x-rays, clothing and fabric. These materials have well established channels in the waste management chain with stable market rates, prompting a brisk movement from generator to aggregator and on to recyclers, where they are converted into raw material that can be used for manufacturing new products.

Some examples of non-recyclable dry waste are certain ceramics, greasy or soiled paper / cardboard and lightweight material like styrofoam / thermocol. Although technically recyclable, these materials do not have readily available ‘takers’ due to the high cost of handling / recycling and the material’s inherent compositional complexities deeming them as non-recyclable. If not segregated appropriately, such material tends to ‘leak’ into the environment posing ecological threats.

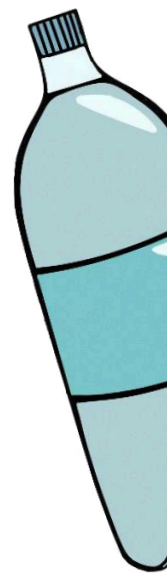
The term ‘non-biodegradable’ is also used to refer to the dry waste category.

Hard Plastic

Plastic material that retains its shape under pressure / does not easily deform. The term ‘rigid’ is used interchangeably with the term ‘hard’ when describing this type of plastic. Some regularly used hard plastics are single use cutlery / crockery, boxes used to pack restaurant takeaway, garden furniture, buckets, water pipes, toys, clear plastic boxes used to pack fruits, blister packs, water bottles, cosmetic packaging tubes and outer casing of electronics, among many others. *These plastics are also referred to by abbreviations that allude to the type of chemicals they are composed of like, High Density Polyethylene (HDPE), Polyvinyl Chloride (PVC), Polyethylene Terephthalate (PET), Polypropylene (PP), etc.*

Hazardous Waste

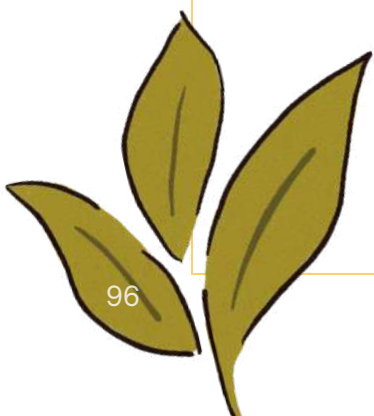
Waste that is toxic, contains harmful pathogens, flammable, corrosive or reactive.





	<p>In the context of this guide, the term hazardous is being used to describe waste generated in a household like used diapers, used syringes, used sanitary napkins, nail / hair clippings, swept up debris from households, expired medication and any material that is soiled with human / animal discharge. It is recommended to dispose of this waste in a sealed manner with a distinguishable mark (like a letter X or a written warning) on the container / bag being used to dispose of it. In the broader context, hazardous waste is also used to categorise bio-medical waste from hospitals, industrial chemicals / solvents, pesticides, acids, etc. This type of waste is generally not recycled and is sent for incineration or specialized processing in designated facilities.</p>
<p>In situ</p>	<p>Situated in the place of origin. In the context of We Segregate, the term ‘in situ’ is being used to describe the composting process as it is being done in the same place (or within the immediate vicinity of) where the biodegradable / organic waste is being generated.</p>
<p>Kabbadiwala</p>	<p>A Hindi word used to refer to scrap dealers who go door to door buying recyclable scrap material, generally from households but also, from small businesses and offices. In Chennai, the colloquial term used to describe such scrap shops is ‘Kailan Kadai’, with the dealers themselves being referred to as ‘Kailan Kadai Kaarar’.</p>
<p>Multi-Layer Packaging</p>	<p>In the context of this guide, multi-layer packaging is used to specifically describe the soft / flexible packets that are used to pack biscuits, chocolates, chips, etc. These flexible packets contain an inner aluminium layer, in addition to the outer soft plastic layer, acting as a waterproof, pest-resistant inner coating for perishable food products. In the context of this guide, the term ‘soft plastics’ is sometimes being used to refer to both flexible plastics like LDPE and these multi-layer packets that</p>

	<p>contain the inner aluminium coating.</p> <p>In the broader context, multi-layer packaging also consists of rigid and semi-rigid composite packaging material often used to hold fluids and liquids like juice, milkshakes and other beverages. A popular example of multi-layer packaging is the Tetra Pak juice/milk cartons. Just like the flexible packets, these cartons also contain a thin layer of aluminium, that is sandwiched between multiple layers of polyethylene and paper, making the carton a contamination-proof encasing for perishables.</p>
Nudge	A subtle suggestion or reminder to encourage a particular action or decision.
Soft Plastic	Plastic that does not hold its original shape when crushed by hand. The term ‘flexible’ is also used to refer to this type of plastic. Some examples of soft plastic are shopping bags, bread packets, milk pouches, plastic film, snack packets, ziplock bags, etc. Much like the hard variety, these plastics are also referred to by abbreviations that allude to the type of chemicals they are composed of, like Low Density Polyethylene (LDPE). In the context of this guide, the term ‘soft plastics’ is sometimes being used to refer to both flexible plastics like LDPE and to refer to soft multi-layer packaging (like biscuit packets) that contain an inner aluminium coating.
Thermophilic	Refers to a stage in the composting process that is characterized by high temperatures (in the range of 45° to 60°C) promoting the growth of thermophiles (bacteria / micro-organisms that thrive in high temperatures). This stage accelerates the composting process by breaking down complex organic waste into simpler organic matter. Harmful components like pathogens and weed seeds are destroyed in this stage making the compost more beneficial for plant growth.



Wet Waste

Organic waste material that easily decomposes into organic matter. Some examples of wet waste are food scraps, fruit and vegetable peels, egg shells, bones, seeds, meat, coffee grounds, tea leaves and garden waste like flowers, leaves and plant clippings. When segregated appropriately and mixed with brown matter like cocopeat, this material can readily be processed into a rich fertilizer or compost. Compost thus generated can be used to replenish nutrients in the soil and promote plant growth.

Note : Although coconut shells are technically organic material and could be categorized as wet waste, it is not recommended to include them in composting as they take much longer to decompose. If included, one would have to remove them from a harvested batch of compost and return them back into the next batch (multiple times) before they subsequently break down.



Additional Information

Online resources

A Guidebook to Zero Waste Offices

by Saahas Zero Waste



Biodegradable Waste Management At Home - A Guidebook

by Ministry of Housing and Urban Affairs &
Deutsche Gesellschaft für Internationale
Zusammenarbeit



'Endlessly Green' - Online Blog by Savita Hiremath

by Savita Hiremath (Founder of Endlessly Green)



A Guidebook For Bulk Waste Generators

by Tamilnadu Green Climate Company &
Deutsche Gesellschaft für Internationale
Zusammenarbeit



Trashonomics

by The Anonymous Indian Charitable Trust



Waste management companies We Segregate team has worked with

Daily Dump

dailydump.org



Endlessly Green

[instagram.com/endlessly_green/](https://www.instagram.com/endlessly_green/)



Namma Ooru Foundation

nammaooru.org



Nilayaan

[instagram.com/nilayaan.earth/](https://www.instagram.com/nilayaan.earth/)



The Bartan Company

thebartancompany.com



The Recycle Mart

recyclemart.in



Wasted 360 Solutions

indiawasted.com





Meet The We Segregate Team



Okapi is a Indian research and consulting group aiming to tackle complex socio-ecological challenges faced by cities. Okapi is the primary implementing partner for the Urban Ocean program in Chennai and is anchoring the We Segregate project.

okapia.co



Residents of Kasturbanagar Association (ROKA) is a Resident Welfare Association formed for solid waste management. ROKA is leading the ground level work for the We Segregate project.

sites.google.com/view/rokawithnature



Chennai Resilience Centre (CRC) is supporting Okapi in the implementation of the Urban Ocean program and by extension the We Segregate project. CRC is fostered by the Atlantic Council's Climate Resilience Center and the Resilient Cities Network.

resilientchennai.com



The Greater Chennai Corporation is the oldest municipal institution in India established on the 29th of September, 1688. Its responsibilities include managing public health, education, roads, storm water drainage, energy and solid waste of the metropolitan city of Chennai which has a population of around 7 million residents.

chennaicorporation.gov.in/gcc/



Urbaser Sumeet is a global environmental solutions company focused on leveraging the value of the world's resources to build a more sustainable tomorrow. The Greater Chennai Corporation, with the vision of making Chennai the most environmentally friendly city in India, has entrusted Urbaser Sumeet with the city's solid waste management in a public-private-partnership.

urbasersumeet.com



Bottles for Change by Biseri International is an awareness program aimed to tackle plastic waste by creating awareness among citizens and channelizing different types of plastics for recycling into utility products such as - apparel, hand bags, window blinds and others.

bottlesforchange.in/home



Spreco Recycling Pvt. Ltd. is a waste management services company committed to providing innovative solutions to help manage different streams of waste. They offer a variety of services including waste collection, recycling, composting, bulk waste processing and waste management consulting.

sprecorecycling.com



Urban Ocean Partners



Resilient Cities Network (RCN) consists of member cities and Chief Resilience Officers from the former 100 Resilient Cities — pioneered by The Rockefeller Foundation program, sharing a common lens for holistic urban resilience. RCN, in partnership with its global community, continues to deliver urban resilience through knowledge sharing, collaboration, and creative action, seeking to inspire, foster and build holistic urban resilience around the world.

resilientcitiesnetwork.org



The Circulate Initiative is a non-profit organization committed to solving the ocean plastic pollution challenge by supporting the incubation of circular, inclusive and investible waste management and recycling systems in South and Southeast Asia. They achieve this by collaborating with key stakeholders across the sector, and by producing insights to support and accelerate investment and scale across the value chain.

thecirculateinitiative.org



Ocean Conservancy invests in cutting-edge scientific research, implements on-the-ground projects, and works with conservationists, scientists, governments, the private sector and members of the public to change the plastics paradigm and create science-based solutions for a healthy ocean and for the wildlife and communities that depend on it.

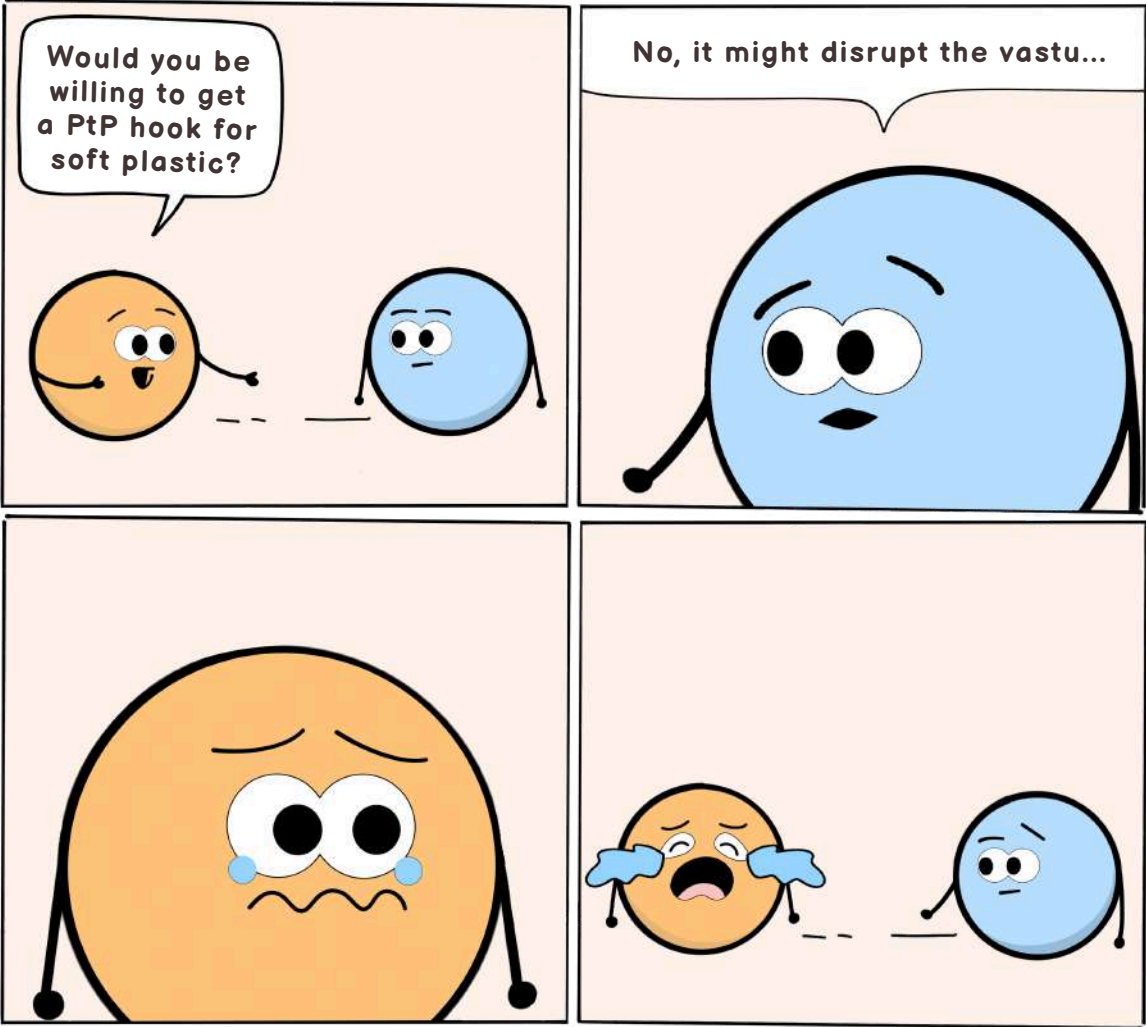
oceanconservancy.org



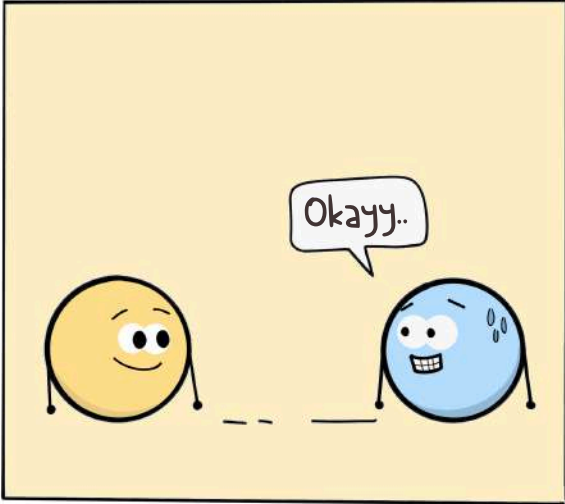
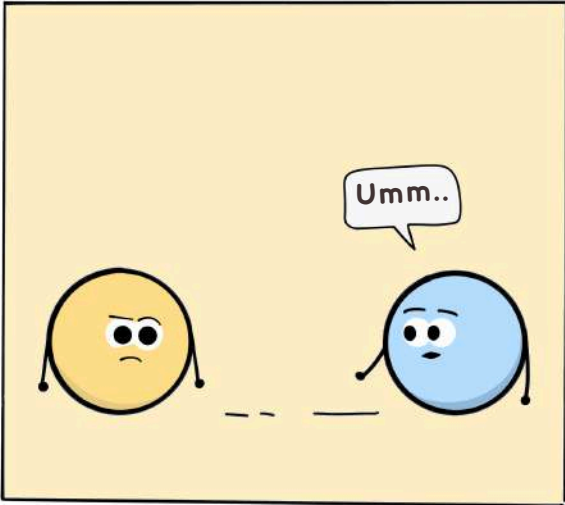
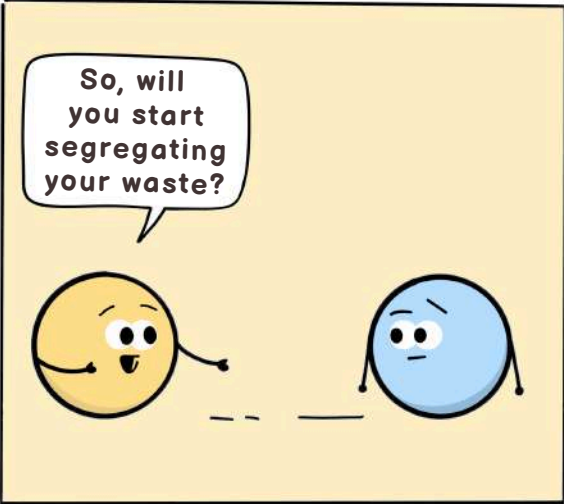
Jenna Jambeck leads the Center for Circular Materials Management in the UGA New Materials Institute. The Jambeck-led Circularity Informatics Lab (CIL) utilizes concepts from the Circular Economy and Green Engineering principles to examine materials and products along their entire value chain and provide data that can assist with decision-making at local levels. In addition to partnering with industry to design healthier materials for use in manufacturing, the UGA New Materials Institute works with businesses, governments, foundations and other organizations to redesign systems so that they generate less waste and promote circularity in materials management.

newmaterials.uga.edu

Priorities..



Persuasion!







In 2021, Okapi Research & Advisory undertook an ecosystem audit to understand the solid waste management system in Chennai including the realities of plastic consumption, reuse and recycling. In addition to decoding the current state of solid waste management, the goal of the audit was to develop holistic solutions to prevent plastic leakage into the environment.

This work resulted in the Circularity Assessment Protocol (CAP) Report which then formed the basis for developing a community led waste management project in Kasturba Nagar, Adyar. Christened 'We Segregate', the initiative is aimed at changing resident behaviour to segregate their waste better.

Hook, Line and Composter is an attempt to present the We Segregate pilot as a living example of a community backed, decentralized waste management system to guide like-minded individuals who are attempting to manage their community's waste.

